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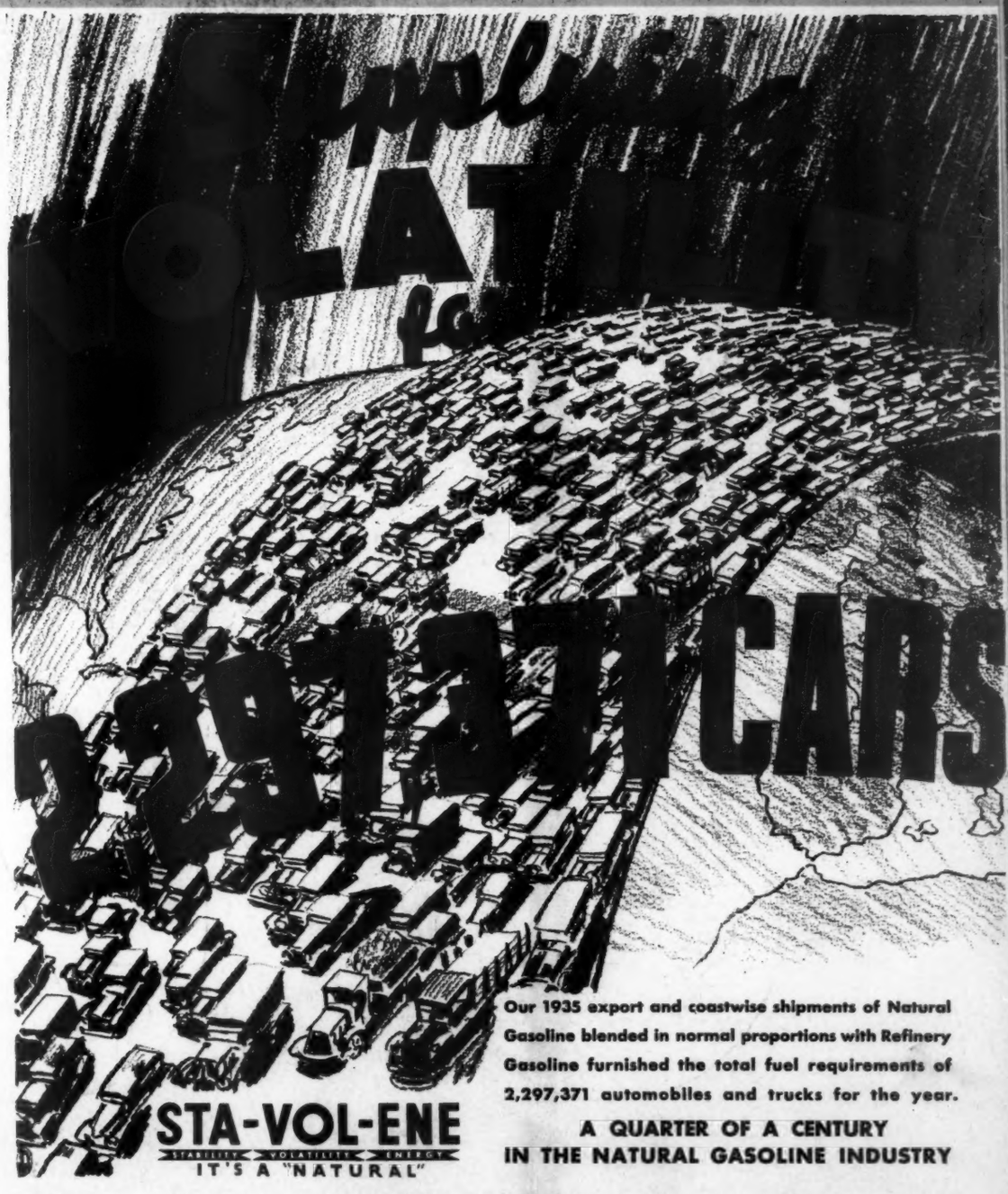

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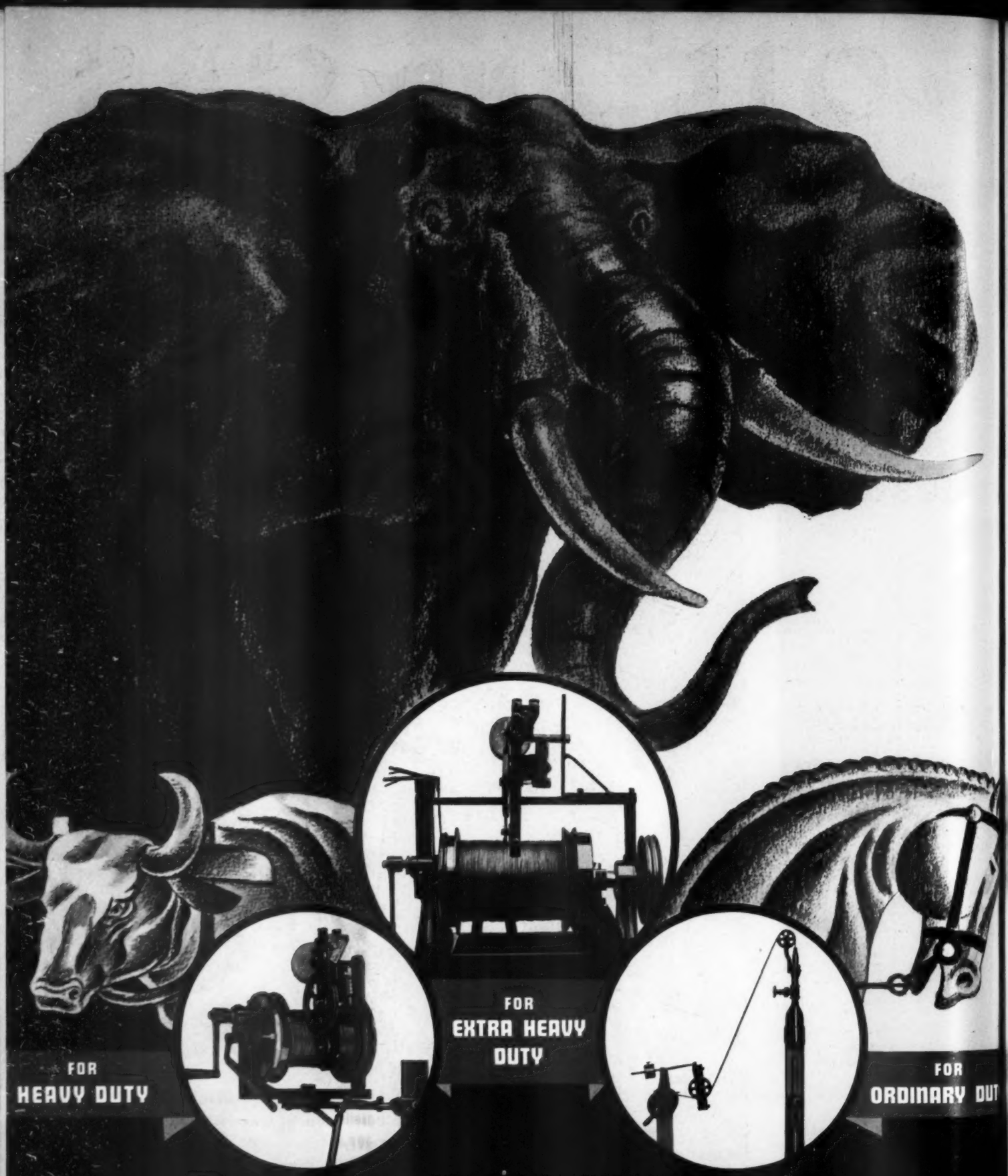

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9 MODELS

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Concern Is Expressed Over Sales Policies

UNEASINESS was expressed this week over the volume of crude being run to stills and evidence in various areas that sound business judgment was not directing sales efforts. Some observers declared the zeal for gallonage might easily become a threat to a gasoline market which right now stands in need of wise, farsighted policies. Experience of other years has not eradicated the idea that losses suffered in gaining additional business can somehow be turned into profit later. As the season of heavy consumption of motor fuel approaches there is the temptation to go after more business, regardless of concessions that must be made to get it. But competitors are reasoning the same way. Informed observers assert refineries are making 10 per cent more gasoline than they should at this juncture. The burden of disposing of it is placed on sales managers. Softening of both retail and wholesale markets is pointed to as evidence that lessons of market history are being ignored in some cases.

In the Permian basin area of West Texas the productive area of southern Ward County was extended southwest and west, and northern Winkler County production was extended a mile north. In the North and Central Texas fields a copious rainfall resulted in 60 new locations and a general resumption of drilling on wells long without drilling water.

The Talco pool in Titus County, Northeastern Texas, was extended 1 mile east by a well that flowed 340 barrels of oil in 14 hours through tubing. The northwest edge of the East Texas field was extended another mile. Seventy-seven new locations were staked in the East Texas field and 55 wells completed. The Amelia field in Coastal Texas was given its second oil well, the South Houston pool was extended northwesterly and wildcats in Montgomery and Calhoun Counties were showing signs of being producers. The east and west sides of the Tepetate field in Coastal Louisiana were defined and the Cheneyville field in Rapides Parish was extended. The Cass County, Texas, end of the Rodessa pool was extended. The 5,800-foot Frio sand in the Saxet field in Nueces County, southwest Texas was given a 7,000-foot southwest extension which leads to belief the sand underlies a large area.

Production 2,962,372

Increase 43,731

In Kansas a 1,000-barrel well opened a new pool in Barton County and a test in Ness County was giving signs of being a pool opener. A new gas area was opened in Rush County. In Oklahoma a prospective oil pool in Beckham County was a feature. Big producers continue to come in regularly in the Oklahoma City pool and the Senora sand in the Olympic pool in Hughes County yielded seven producing wells in the past week. In North Louisiana operators were interested in the prospect of opening a deep producing zone 30 miles south of Rodessa.

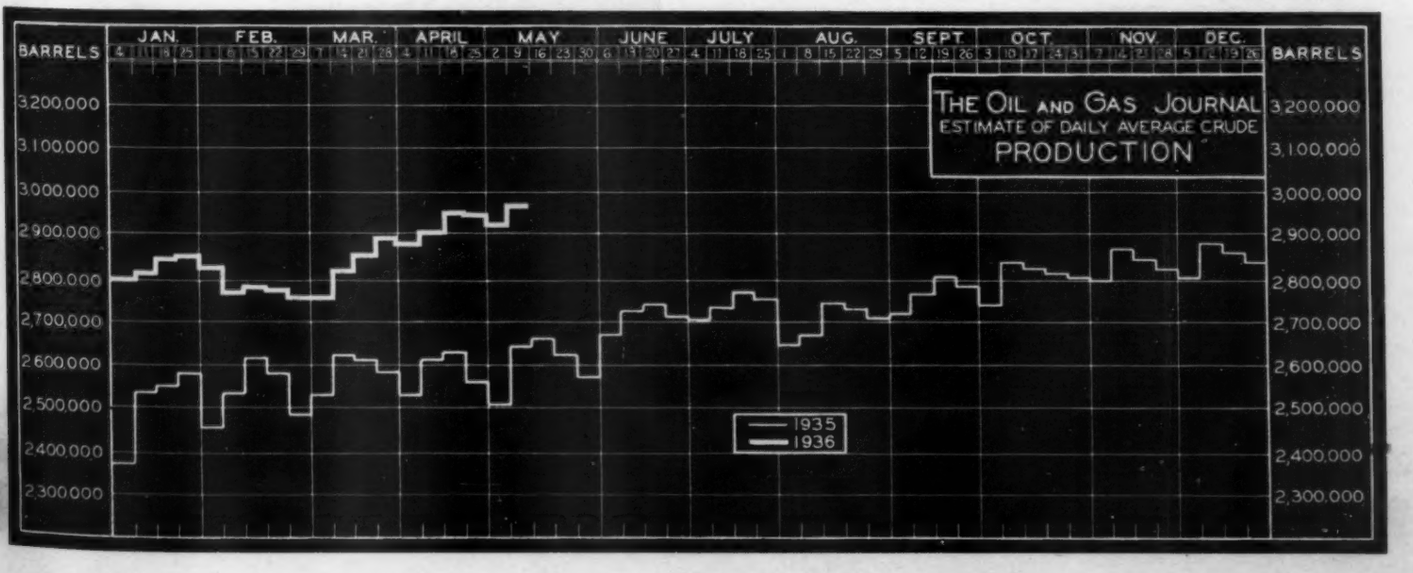
Daily Average Production for Week

	May 9 1936	May 2 1936	May 11 1935
Oklahoma City	127,950	121,200	175,180
Seminole-St. Louis	102,675	103,900	98,200
Remainder of State	307,200	306,900	249,445
Total Oklahoma	537,825	532,000	522,825
East Texas	457,739	455,857	468,077
West Texas	185,050	181,296	151,157
North Central Texas	84,650	84,545	83,354
Texas Panhandle	56,744	66,150	62,153
East Central Texas	52,897	50,348	48,456
Gulf Coast Texas	252,487	246,695	178,273
Southwest Texas	81,145	80,579	63,159
Total Texas	1,170,712	1,165,470	1,054,629
North Louisiana	73,855	70,340	23,055
Gulf Coast Louisiana	145,350	145,597	105,150
Total Louisiana	219,205	215,937	128,205
Santa Fe Springs	45,100	42,750	38,750
Long Beach	68,250	66,800	70,500
Mountain View	27,900	26,700	11,900
Kettleman Hills	81,250	79,800	55,000
Remainder of State	361,400	345,450	340,000
Total California	583,900	561,500	516,150
Kansas	155,200	162,625	145,850
Arkansas	29,925	30,075	31,295
Eastern Fields	108,000	104,500	106,500
Michigan	34,195	33,654	39,908
Rocky Mountain area	123,410	112,880	99,150
Total United States	2,962,372	2,918,641	2,644,512

Crude Oil Stocks in U. S.

(BUREAU OF MINES ESTIMATES)

Week ending April 25, 1936	313,132,000 Bbls.
Week ending April 18, 1936	313,045,000 Bbls.
Week ending April 27, 1935	341,984,000 Bbls.



SPARKS FROM THE NEWS

Tip

A.G.A. to spend $500,000 in cooperative advertising to promote new markets for gas. Not afraid some may benefit more than others. Example to oil industry.

Alternative

Lon Smith thinks Texas is not getting equitable share of production and threatens to grab it. At distress prices?

Obstacle

Overproduction postpones crude price revision and retards gasoline advance. What's the answer?

Argument

If states persist in exceeding allocations, despite compact, advocates of federal control will not overlook it.

Invasion

That Rodessa four and a half mile extension into Cass County, Texas, may be all too true.

Discovery

Massachusetts state senator has discovered gasoline tax diversion is a "racket" and proposes abolishing tax.

Hope

Arkansas permission to produce 1,000 bbls. per well is, however, a "when, as and if" proposition.

Chickenfeed

Australian government is to spend a million in search for oil. Huh! Several American operators have done that.

Security?

Louisiana's new governor proposes increase in tax on natural gas for social security revenue. Where does this end?

Surfeit

Pipe line in Southwest Texas protests production has exhausted maximum storage.

Plebiscite

Initiative petition in Washington State to limit gasoline tax to 3 cents and no diversion. "Let the people rule!"

C. O. D.

British government was taunted in parliament with earning money supplying oil to Italy while demanding sanctions. Well, didn't it make a profit?

Heat

Oil burner shipments in first quarter increased 50 per cent over last year's same period. Points to another increase in furnace oil demand next season.

Touraide

One oil company's tourist aid service reports itself 25,000 behind and expecting 400,000 calls for maps this year. "See America First!"

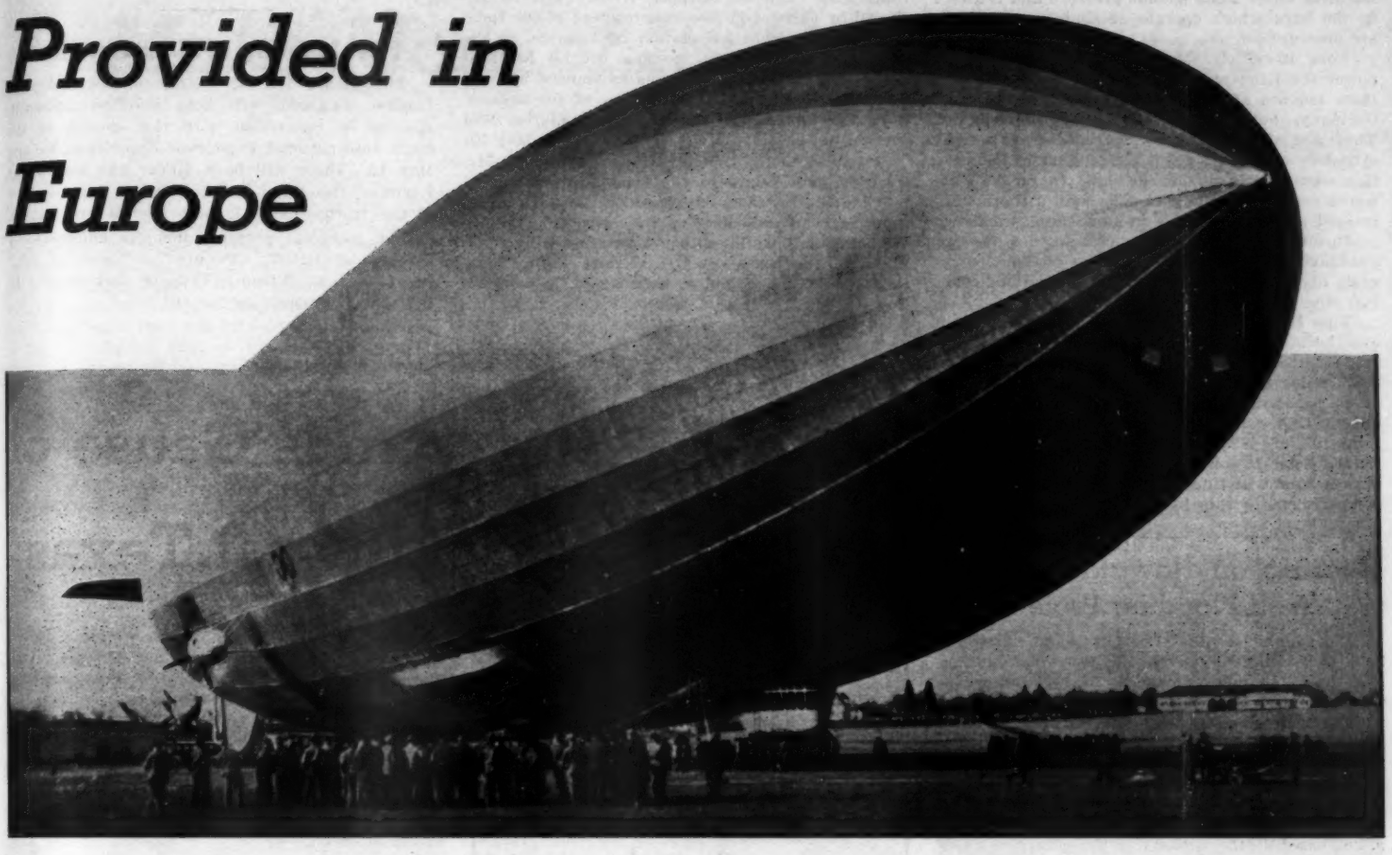
Barometer

April automobile production highest since 1929 and 19 per cent over year ago. And they must have "gas."

ONE WAY TO LIFT CHURCH DEBT

This Oklahoma City church made a contract with the company drilling the well to be paid $50 for each service disturbed by the noise. Total per Sunday not to exceed $100. The church has leased its land for $2,500 and shares in royalty

Markets for Bahrein Island Oil Provided in Europe



NEW YORK, May 11.—The departure here tonight of the giant dirigible airship Hindenburg following its arrival on Saturday has been accompanied by several developments of special interest to the oil industry. It marks the start of a new transportation service in which specially manufactured petroleum fuels and oils play an essential part and which in time may prove to be another important outlet for the industry's products.

T. RIEBER
Who crossed on Hindenburg

The fact that Capt. T. Rieber, chairman of the board of the Texas Corp. was a passenger on the return trip to Germany also indicates that companies with world wide operations may make use of the new transportation facilities due to the saving in time in trips to and from Europe from the United States and Argentina.

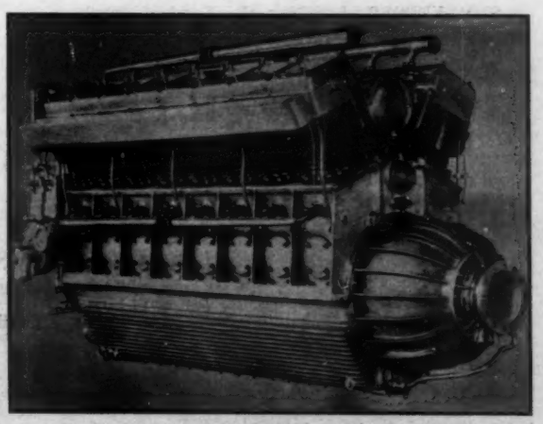
Indicative of the international aspects of the new transportation development considerable importance is attached to the trip of Captain Rieber for many years a well known figure in foreign oil operations. It is reported here his trip at this time is concerned with the preliminary plans for a joint marketing arrangement of Texas Corp. and Standard Oil Co. of California which has been rumored for some time.

It is understood a plan has been worked out by the two companies which will furnish outlets for the new refinery which the Standard's subsidiary, Bahrein Petroleum Co., is building on Bahrein Island in the Persian Gulf. The Standard company is developing a major field on a concession which it owns on Bahrein Island and a refinery with an initial capacity of 10.000 bbls. daily is now being built to absorb part of the crude oil production available.

Standard of California does not have its own marketing facilities in foreign areas which could be conveniently served by the refinery and crude supply and there has been considerable speculation as to how these would be made available. The arrangement with Texas Corp. is considered logical because the corporation does not have important crude oil production outside the United States, with limited refining facilities. Its distribution in Europe and other continents is largely supplied from its refineries in the United States. The California Standard is reported to have recently organized marketing subsidiaries in England, France and Germany and has plans to form units in other countries.

The Hindenburg which has a capacity of 50 passengers with a crew of 40 men arrived Saturday morning after establishing a record time of 61 hours and 50 minutes for the transatlantic trip from Friedrichshafen, Germany. The refueling operation started immediately. It took on 1,400,000 cubic feet of hydrogen gas supplied by the hydrogenation plant of Standard Oil Co. (New Jersey). This was the original hydrogenation plant built in this country and is located at the company's Bayonne, N. J., refinery. The capacity of the bag of this ship is 7,063,000 cubic feet but only 1,400,000 cubic feet new gas was necessary for the return trip. Standard's subsidiary in Germany, Deutsche Americansche Petroleum Gesellschaft, furnishes the gas at the German terminal.

The Standard company also furnished 15,000



One of the four diesel engines

gallons of diesel fuel required for the return trip. This is a special fuel refined from Colombian crude oil. The various grades of lubricating oil required by the ship amounting to approximately 1,000 gallons were furnished by Tide Water Oil Co. The hydrogen gas for refueling is taken to the field under 2,200 pounds pressure and released in the bags which operate at slightly more than air pressure.

Four 16-cylinder Mercedes-Benz diesel engines power the Hindenburg. Details of construction of these engines are kept as a government secret of Germany, but each develops 1,100 horsepower. They are of the V type construction, with eight cylinders on each side. Each engine is mounted in a separate car outside the ship, two on the starboard and two on the port side, with a thoroughly trained mechanic on duty in each car at all times.

In addition to the main diesel engines are two auxiliary diesel-electric engines of 50 horsepower each to provide for lighting, refrigeration, cooking, etc.

The Hindenburg is the largest rigid airship ever built, with a length of 811 feet and a diameter of 135.7 feet. It has a maximum speed of 84.37 miles per hour and a cruising speed of 78 miles per hour, with a cruising range of 8,750 miles. Under normal conditions the ship has a total lift of 472,940 pounds (approximately 235 tons). Some 12 tons of freight can be carried and a passenger will find room enough in the freight compartment to ship his automobile if he desires.

Hearing on Nowata Lake for Well Flooding Project

The Oklahoma State Conservation Commission held a hearing May 8 on the proposed dam on Big Creek, 10 miles northeast of Nowata, which would create a lake covering 2,500 acres to supply water for flooding operations in the Nowata field.

Those testifying in favor of the dam, which a group headed by V. J. Houston and George Travis of Tulsa is proposing to build at a cost of $150,000, said the watershed would furnish 45,000 acre feet of water during a normal year. According to estimates based on the porosity of the sand, the water required for the entire flooding operation would be 40,000 bbls. per acre. It was estimated there are between 10,000 and 15,000 in the Nowata area and that at least 12 years would be taken in a field-wide flooding operation. Some filtering would be required and the price to be charged oil operators would depend to some extent on the filtering needed. W. R. Holway, hydraulic engineer, and A. B. Morris, petroleum engineer, furnished most of the testimony.

Testimony protesting against the dam was heard from certain city officials, oil operators in the Nowata field, and farmers.

The commission acknowledged the testimony established the project was valid and for a bona fide use and further study would be given to the factors involved.

Injunction Sought Against U. S. Tender Board on Pelican

SHREVEPORT, La., May 11.—Another sequel was written last week in the Pelican Oil & Gasoline Co. back allowable and "special order" case when East Texas Refining Co. and East Texas Pipe Line Co. entered suit at Tyler seeking an injunction against the Federal Tender Board. The East Texas companies now have on hand approximately 50,000 bbls. of Rodessa crude produced during the few days Pelican Oil & Gasoline Co.'s 13 wells were each allowed to produce a maximum of 1,500 bbls. daily. The East Texas companies' petition, filed in Federal District Judge Randolph Bryant's court at Tyler, seeks injunctions to prevent the tender board from passing on legality of the crude and also to prevent the board from requiring tenders on the oil.

The complainants' petition argues that the Connally act, which prevents movement of oil in interstate commerce produced in excess of state regulation, does not authorize the board to pass on and enter decrees or orders pertaining to legality of oil produced outside of Texas.

National Stripper Association Annual Meeting May 22

"The Future Possibilities for Stripper Wells With Particular Reference to the Economic Importance and Value of Stripper Wells," will be discussed by Charles F. Roeser, president of the Independent Petroleum Association of America, as the feature of the annual meeting of the National Stripper Well Association, was announced by William Bell, Robinson, Ill., president of the association. The annual meeting of this association will be held at the Mayo Hotel, Tulsa, Friday, May 22.

It was stated by Mr. Bell that following Mr. Roeser's address there would be a discussion of the address by representatives of the 18 associations that are members of the National Stripper Well Association, this discussion to be led by P. B. Flynn of the Reno Oil Co., Wichita Falls, Tex.; Ray M. Collins of Tulsa, and W. W. Warner of Nowata, Okla.

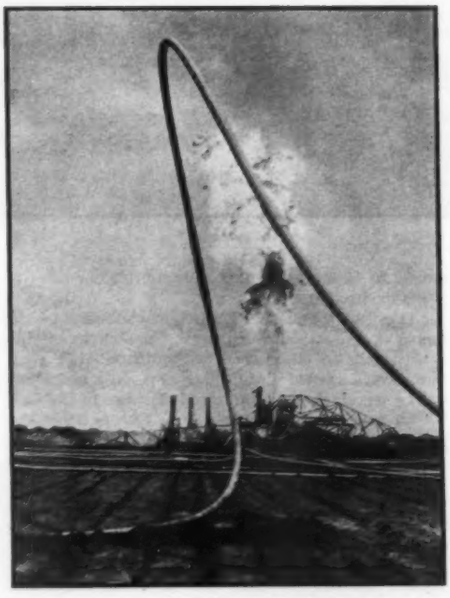
From the reports received at the headquarters of the National Stripper Well Association, Mr. Bell reports stripper well operators from practically every state east of the Mississippi River and every state in the Mid-Continent area will be in attendance.

First Meeting I.P.T. in America

The Institution of Petroleum Technologists, London, England, will hold its first American meeting in connection with the opening of the ninth International Petroleum Exposition, Friday, May 15. There will be a dinner and meeting at 7 p.m. at the Mayo Hotel, to which the members of the institution and their friends are invited.

The technical program includes addresses by Dr. Gustav Egloff, "Twenty-five Years of Oil,," Dr. Robert E. Wilson, "Propane Dewaxing"; E. DeGolyer, "Prospecting for Oil."

High Pressure Sands Cause of Blowouts in Southwest Texas



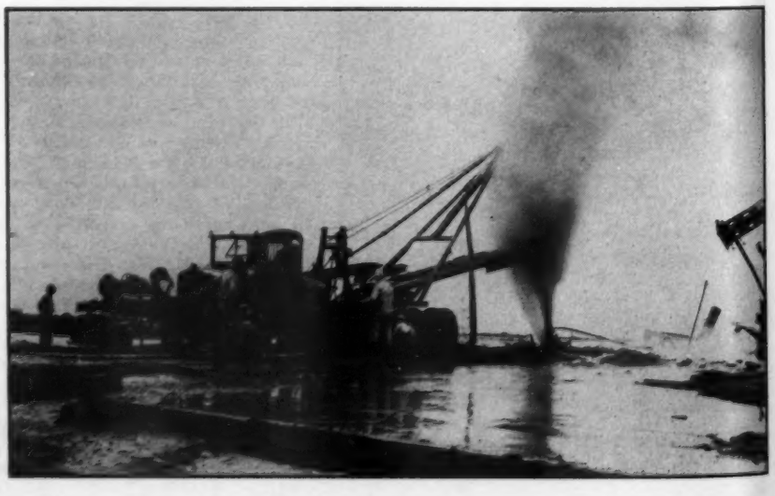
Plymouth well blew out drill stem in fantastic loops, destroying much property

SAN ANTONIO, Tex., May 11.—High pressure sands in the Lower Gulf Coast accounted for two more blowouts over the past week. Both occurred on wells being drilled by the Texon Drilling Co., one, No. 3 Lingnau in the Clarkwood section of the Saxet field in Nueces County and the other No. 1 Rambo on the south edge of the Plymouth field in San Patricio County. Both ran wild for about three days before being brought under control by the H. L. Patton Oil Well Fire Fighting Co. of Houston.

Tubing was being run on the 4,400-foot sand of the Saxet well when it went out of control. The wild gasser made great quantities of wet sand blown over the town of Clarkwood and surrounding country by strong winds. Derrick and rig were moved from the well site and the gasser was capped by stabbing a large swedge-bottom nipple in the top of the casing.

No sooner had this well been plugged than the company's No. 1 Rambo in Plymouth blew out while testing the 5,600-foot sand of the field. The drilling string was blown out of the hole and the ensuing fire destroyed rig and derrick and two trucks. No personal injuries to the crew were sustained, however. The Patton crew moved on the well directly from Saxet and in three days the burning gasser was extinguished and shut in.

Activity in the Saxet field is centered in this area north of the town of Clarkwood with five new producers and one abandonment recorded.



Trying to stab nipple on wild Saxet well

Awakened Natural Gas Industry Will Make More of Its Opportunities

By T. F. SMILEY

DALLAS, Tex., May 9.—An awakened natural gas industry held its four-day annual convention here this week. Papers and off-the-platform utterances pointed to an aroused consciousness of opportunity and to determination to make much more of it than has been done in the past.

The convention, that of the Natural Gas Department, American Gas Association, opened Tuesday and closed Friday forenoon. Meetings were held in the Baker and Adolphus hotels. Close to 1,000 delegates were present, according to Capt. A. E. Higgins, secretary. William Moeller, Jr., vice president of the Southern California Gas Co. and chairman of the Natural Gas Department, served as general presiding officer. The unusually large attendance at all sessions, the high quality of the papers and the exceptional interest evinced in them were subjects of gratified comment.

WM. MOELLER, JR.
Chairman, Natural Gas Department

One evidence of the more aggressive policy adopted was seen in plans for a huge advertising campaign to spread the story of gas as an incomparable fuel.

Putting in Human Element

A significant note struck by more than one speaker related to the moral accountability that rests upon gas companies, an obligation to give a service dissociated from the purely commercial aspects of the business. Such a service would draw upon the human side of every individual in the company, from meter-reader to chairman of the board. L. B. Denning, president of the American Gas Association and also president of the Lone Star Gas Co., touched upon this responsibility at the first session when he said: "There are two ways of giving service. One is through appliances. The other is by going further and putting in our hearts and souls—the human element—and making friends."

Oil and gas are becoming less and less centers of separate interest and study. The similarity (in some cases the actual oneness) of their problems is drawing these two divisions of a great industry into increasingly close relationship, it was revealed by papers and technical discussion.

The last year has seen marked advance along engineering lines in the natural gas division and production men are taking a larger place, as was evidenced at this week's convention in the fact that one entire session was sponsored by the General Committee on Natural Gas Production, a new committee.

Captain Higgins and Major T. J. Strickler, general manager of the Kansas City Gas Co., explained that $500,000 a year will be expended for three years in the advertising campaign, plans for which have been virtually completed. The campaign, conducted and paid for by the gas companies having 72 per cent of the meters in service, will penetrate every part of the United States through magazines of national circulation. It will be directed mainly to domestic consumers, emphasizing the cleanliness, flexibility of control and heating value of gas. The first of these advertisements, according to present plans, will appear next September. Gas companies in various areas are expected to cooperate with local advertising.

In connection with this plan to familiarize the public with the merits of gas M. E. Jacobs, of Omaha, Neb., took some good-natured shots at the natural gas men, and they seemed to like it.

Gas Industry Dozed

"The gas is in the field, crying for sale," said Mr. Jacobs. "While the gas industry dozed the electric industry carried on a series of modern national campaigns that have made history in American selling. I was chairman of the national planning committee that directed this activity, and we were scared to death lest you folks in the gas industry might suddenly wake up and organize a bureau of your own. We misjudged you. We continued this activity for three years, and then added another year, four years in all, and you folks peacefully slumbered in your antique shop. Then you woke up. It was about time. Let me tell you now that your national cooperative advertising campaign won't amount to a tinker's dam unless you put behind it real modern commercial action. Some of you who have seen the gas business slip away from you may not realize it, but you have a marvelous story to tell and a fine service to sell."

In welcoming the delegates to Dallas J. F. Leopold, supervisor of public utilities, declared his conviction that natural gas companies merit few of the assaults and suspicions to which they have been subjected. His own dealings with utilities, he asserted, had raised his confidence in their fairness and their efficient management. "There has been a lot of fuzzy thinking on this point," said Mr. Leopold. Touching the government's attitude toward public utilities Mr. Leopold remarked, "I was taught we had popular government. I still believe we have, but only during the first two or three months of an administration."

L. B. DENNING
President, American Gas Association

Experimental work in the Cleveland, Ohio, laboratory is bringing about notable advances in the efficiency of gas appliances and in knowledge of proper mixing of natural and manufactured gases to achieve the best results, it was announced. The laboratory work is proving of high importance in areas where the natural gas supply is inadequate to meet demands, making it necessary to combine manufactured gas with it. The laboratory is under the joint sponsorship of the American Gas Association and the Manufacturers' Association affiliated with it.

C. K. Patton, commercial manager of the Dallas Gas Co., told how his organization had catalogued

FLARES

Gas companies having 72 per cent of the meters in service will expend $1,500,000 in a national advertising campaign spreading the story of gas, the incomparable fuel.

M. E. Jacobs said the campaign "won't amount to a tinker's dam unless you put behind it real modern commercial action. You have a marvelous story to tell."

Obligation rests upon gas companies to give a service dissociated from purely commercial aspects of the business, a service that demands "hearts and souls."

Similarity of their technical problems is drawing the oil and natural gas industries into much closer relationship.

Production men are taking a bigger place in the natural gas industry.

Experimental work in the Cleveland laboratory is increasing the efficiency of gas appliances and adding to knowledge of utilization.

The natural gas industry deserves few of the assults and suspicions directed at it, largely the result of "fuzzy thinking."

No industry gave more whole-souled, cheerful cooperation during the operation of the N.R.A. than did the natural gas business.

Florists don't sell flowers. They sell sentiment. The gas industry should sell comfort, health, convenience, modernity, instead of price and operating costs of appliances.

Stripping plants in the Texas Panhandle last year blew more gas into the air than was used for domestic purposes in the entire United States.

the common cold as public enemy No. 1 and had explained to the public how this enemy could be overcome in great measure by proper heating of homes and offices. He told how improved types of equipment had eliminated "sweating" of walls and windows by circulating fresh, warm, pure air throughout the rooms.

"During the depression no industry gave more whole-souled, painstaking and cheerful cooperation with those endeavoring to solve problems affecting the nation than the gas industry has," L. B. Denning declared in his talk at the opening session. "At no time have I been able to discover any particular ill feeling toward government officials. While the NRA was in existence the gas industry gave its fullest cooperation. It accepted additional burdens cheerfully and gave a fair and honest trial. I do not know even today any section of the gas industry that has attempted to go back to conditions that prevailed prior to NRA. The gas industry has shown a fairness and broadmindedness in approaching these problems that I have not found in some other industries. I wonder if we realize the importance of this industry. We are accustomed to think of the electric industry as bigger. Yet in 1935 the total number of kilowatt hours delivered by all electric plants in the United States—privately, governmentally or municipally owned—was 78,000,000,000 KVA. Natural gas used in theoretical heat energy represented six times the total amount of KVA put out by the whole electrical industry, and measured by heat efficiency represented two and one-fifth times the electrical output.

"We live closer together than at any other time in our history. The biggest asset we can have in our community is the number of friends all of us can count on. We symbolize to the average customer the organization. Human beings cannot be regulated by formulas. You can devise chemical and mathematical formulas, but you cannot lay down definite formulas for human beings, because the human element may upset the whole thing. But we can formulate our conduct, showing our customers that we ourselves are honest and are giving the best we have. It is up to all of us, whether we are cashiers, production men, superintendents or presidents, to conduct ourselves in our everyday life so that we carry the example of good citizenship all the way down the line, having pride in our work, giving the best possible service and maintaining our right to a fair compensation for it."

In the session Wednesday forenoon sponsored by the Main Technical and Research Committee of which H. C. Cooper, president Hope Natural Gas Co., Pittsburgh, Pa., is chairman, attention was directed to the fact that many of the problems confronting gas producing companies are essentially the same as those confronting oil producing companies. Even in recent times it has been common practice for gas companies, on striking oil instead of gas, to sell the well to an oil company. They wanted gas, not oil. Now, however, an increasing number of gas companies are themselves operating such oil wells, as well as combination oil and gas wells. As a result they must be equipped to deal with oil producing problems.

Reporting as chairman of the subcommittee on Gauging Gas Well Deliveries, N. C. McGowen, Shreveport, La., told how two problems of increasing importance, (1) gauging deliveries from combination gas and oil wells and (2) controlling deliveries from high-pressure gas wells had been made subjects of cooperative study by the subcommittee and the U. S. Bureau of Mines.

More Combination Wells

"Oil and gas reserves discovered during recent years have been found at increased depths below the surface of the ground, and reservoir pressures have been correspondingly greater than initial pressures in the older, shallower reservoirs were," said Mr. McGowen. "A significant feature of the productive wells completed in the deeper horizons is indicated by the increased proportion of the wells that are capable of producing both gas and oil in considerable quantities during the initial stages of their depletion as compared to those that could be classified readily as either gas or oil wells. Due to the increase in the proportion of wells from which both gas and oil are produced through the same string of casing or tubing as compared to the number from which gas and negligible quantities of oil are produced, and due to the magnitude of the rate of gas delivery from many of the combination wells, this class of wells is becoming of greater importance as a source of natural gas supply.

"The problem of gauging and controlling combination wells involves (1) fundamental studies of reservoir fluids; (2) studies of temperatures, pressures and fluid states in the flow string; (3) studies of structure and stratigraphy of the productive horizon and of the physical characteristics of the strata included in the reservoir zone; (4) studies of gas-oil ratios of reservoirs and of individual wells and many other factors.

"Progress in the problem has been made in the last year. Much of the equipment necessary for gauging subsurface temperatures and pressures and for obtaining samples of reservoir fluids from wells in which pressures range up to 5,000 pounds per square inch has been developed or improved and is now being used in the field. Field work carried on in the past year includes studies of wells in Central Kansas, Oklahoma City and Rodessa. A survey is being made of the fields in Texas that are productive of gas and oil to facilitate selection of representative types of reservoirs for an extensive study of the problem which is to be carried on in the state during the summer. The program for the coming year includes studies of wells in Texas, Louisiana, Kansas and Oklahoma."

Enormous Gas Wastage

Gas wasted by stripping plants in the Texas Panhandle exceeded the total of all the gas consumed for domestic purposes in the United States, according to Dr. John W. Finch, director of the U. S. Bureau of Mines, Washington, D. C., whose address was read by R. A. Cattell, of the Bureau. "Most of that waste has ceased," said Doctor Finch, "but the situation in the Panhandle is still full of difficulties. Conservation means not hoarding, but orderly and efficient use in the interests of national welfare without waste either of the resources themselves or of the human elements involved in their processing. The interest of the association in the technical problem of gauging and controlling combination wells is evidence of the close interrelation between the oil and natural gas industries. With those industries working hand in hand and with the government aiding through research of the kind that is being conducted by the Bureau, we are increasing our fund of technical knowledge to serve as a foundation upon which to build a wiser and more effective use of our oil and gas resources."

CHRISTENING THE NEWEST GULF TANKER

—Acme

Constance C. Drake, of Pittsburgh, Pa., christening the "Gulfdawn," newest addition to the Gulf Fleet, launched at Chester, Pa. Miss Drake is the daughter of Col. J. Frank Drake, president of the Gulf Oil Corporation

Rodessa Extension in Texas Estimated 350 Bbls.

SHREVEPORT, La., May 11.—Although no gauge will be possible until tankage is completed late this week, oil produced into pits from American Liberty Oil Co. No. 1 Marcus Rambo in the J. H. Rives Survey, Cass County, Texas, definitely proves a 4½-mile southwestern extension to the Rodessa pool. (See map page 11, The Oil and Gas Journal, May 7.) While flowing intermittent heads of oil and gas through open tubing and later through various size chokes, it was estimated capable of yielding its allowable of 350 bbls. of oil per day with about 5,000,000 feet of gas. Casing is set at 5,993 and the hole is bottomed at the plugged back depth of 6,010 feet. It was originally carried to 6,072 feet, but the lower section was barren.

Chief benefactors from the extension are R. W. Norton (Magnolia), United, Phillips, Texas Co., Tide Water, Superior of California, and Showers and Moncrief. Sandy, porous lime section cored from 5,508-20 feet carrying good odor of gas and good show of oil under ether with 15 per cent porosity heightened prospects for a wildcat discovery in Webster Parish, Louisiana. The test from which formation showing gas and oil was recovered is J. P. Evans and others No. 1 Crichton, in section 35-18-9 south of Minden. Operators have ordered out casing which will be set after another short core is cut.

Arkansas Enters Proration Problem With 1,000 Bbl. Well Allowable

By H. STANLEY NORMAN

SHREVEPORT, La., May 11.—Southern Arkansas, neglected in the past few years in terms of exploration and field development, entered a strong bid last week for higher rank in the oil business.

The bid for "spot" position was entered through discovery of deep lime production—deep so far as stratigraphy and Arkansas are concerned, but relatively shallow in terms of modern drilling depths—by recompletion of Phillips Petroleum Co. No. 1 J. D. Reynolds, SE SE NW section 27-13-15, on the northeast flank of the Smackover pool in Ouachita County.

Production from the Phillips discovery well—rated on completion at 207 bbls. of 53 gravity distillate in 24 hours—is considered by technicians as relatively unimportant. Due to unfamiliarity with reservoir conditions and coupled with the fact that gas production gauged 13,290,000 feet per day, it is generally believed the pipe was set too high in the section to obtain maximum oil yield. In view of the various factors, including that of caution and safety in setting pipe to protect the newly discovered producing horizon, Phillips operation of the property is regarded as highly successful.

Offsets Staked

Substantiating the belief that the new Snow Hill discovery is of major importance, three locations were immediately staked around the discovery including one by the discoverer, one by Lion Oil Refining Co. and one by Standard Oil Co. of Louisiana. The newly discovered deep pay horizon in lime topped at 4,908 feet and drilled to 4,926 feet, is within easy reach of modern drilling equipment and with guidance of the discovery well log, immediate testing of the horizon's full productive ability will be determined speedily.

Movement of the discovery well rig to another wildcat location in western Bradley County, presages early exploration of other Phillips Co. holdings in the vicinity. The Bradley County location, in section 12-17s-11w, is about 24 miles east and 8 miles south of the Ouachita County discovery well. Phillips has 175,000 to 200,000 acres of wildcat acreage leased or held under shooting option in Ouachita, Bradley, Ashley, Calhoun and Union Counties, Arkansas, and extending to the Monroe gas field in northern Louisiana. Due to the fact that a bulk of the acreage in this district is owned in huge tracts by various lumber companies, seekers of protection on and near the Phillips Co.'s geophysical "pictures" are meeting difficulty in locating open leases. Scattered purchases have been made by Lion, The Texas Co., Sun Oil Co., H. L. Hunt, Inc., Gulf Oil Corp., Shell Petroleum Corp. and others. However, all the scattered acreage leased by others is infinitesimal compared to Phillips' holdings.

Arkansas' "Liberal Policy"

The Arkansas Conservation Board has indicated that it will maintain a liberal policy in allocating production to the new deep lime pay wells, setting a maximum of 1,000 bbls. per day per well at the first hearing held last week in El Dorado. At the El Dorado hearing, it was the testimony of D. K. Knowlton, Phillips executive from Bartlesville, Okla., that geological indications point to the new field covering parts of section 16, 17, 20, 21, 22, 26, 27, 28 and 39-15-15. For those with a flare for figures, the spacing regulation of one well to 20 acres, will permit 32 wells to the section. If all nine sections were to be proven productive, drilling of 288 wells would be possible. Following the same line of latitude with figures, the allowable of 1,000 bbls. per well could, under unvariable conditions, build up production of 288,000 bbls. daily.

Arkansas seems confronted with much the same problem as faces Louisiana in the matter of hanging out attractive signs for oil companies to drill and develop new production. If the Permian lime proves productive over an extensive area, Arkansas offers the advantage of about 1,000 feet less of hole to be drilled, an item in any man's oil field.

While Louisiana is not openly jealous of neighboring states' markets, there is a distinct feeling of dissatisfaction toward continuance of market demand calculations for the state on a basis of production existing for three or four years prior to discovery of Rodessa. No doubt the same feeling exists in Arkansas with relation to its crude oil supply quota and its neighbors.

If any inequities exist between the production in Louisiana and neighboring states, the question confronting oil men here and the state administration, is how to adjust them without becoming involved in outside regulation.

Governor Leche's Attitude

Gov. Richard W. Leche, inaugurated as Louisiana's chief executive May 12, has been frank in opposing, for the present, the interstate oil compact. His opposition is founded on two principles, friends say. One is the pressure for additional tax revenue to meet social security act requirements and the other to maintain conditions attractive to business. With the Louisiana severance tax scaling up to 11 cents per barrel on 40 gravity and above crude oil, high production is extremely important to those charged with functions of government.

In meeting the demand for more tax revenue from higher production, however, the Louisiana administration is mindful that continued expansion of production is contingent on maintenance of conditions that will attract drilling and that involves a profitable price for crude oil at the well.

The problem facing the Louisiana administration is how far can production be pushed upward without lowering market price, which would defeat the purpose of the entire program. In addition, of course, there is the ever present possibility in the oil business that new fields will not be discovered rapidly enough to supplant the natural depletion of those in existence.

Lon Smith's Attitude

The attitude of Louisiana officials with respect to the Interstate Oil Compact or similar attempts to equitably distribute production among the various states is particularly interesting in view of Lon A. Smith's expression at Austin, Tex., last week. Mr. Smith, member of the Texas Railroad Commission and its former chairman, has been repeatedly overruled by the votes of Col. E. O. Thompson, present chairman, and C. V. Terrell, the third member, but his charge last week that the interstate compact is working a hardship on Texas must be considered at its face value.

Mr. Smith's declaration that other states are producing more in excess of Bureau of Mines calculated requirements than is Texas serves to show how the wind is blowing. It illustrates the probable unwillingness of Texas or any other compacting state to maintain present restrictions or tighten those existing if neighbors are inclined to persistently increase production. So far as Louisiana's interior affairs are concerned, oil men do not anticipate much change of the present order at the regular session of the legislature which convened Monday. An increase, the amount of which has not been determined, is likely on the natural gas production tax which is now a fifth of a cent per 1,000 feet. In an interview at Baton Rogue last week, Governor Leche declared that the natural gas tax will probably be increased.

The only other legislation so far talked of with which oil men are concerned is the possibility an effort will be made to broaden the Louisiana chain store tax to include service stations.

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State wells near Oklahoma capitol

Tide Water Associated Election

NEW YORK, May 11.—At the annual meeting of Tide Water Associated Oil Co., some 4,100,000 shares voted in favor of the management, headed by William F. Humphrey, president, compared with approximately 1,000,000 for the Getty interests.

Mr. Getty and Thomas A. J. Dockweiler, attorney for the Getty interests, failed of election to the board.

Those re-elected were: Alden Anderson, president of the Capital National Bank of Sacramento; George N. Armsby of New York, and Edward H. Salrin, vice president of Tide Water Oil Co. R. M. Sands, director of Associated Oil Co., California subsidiary of Tide Water Associated, was also elected.

At the annual meeting of the Tide Water Oil Co., all the directors were relected except Mr. Getty. Frank Haskell, formerly a director of Tide Water Oil Co., being elected in Mr. Getty's place. It was said Mr. Haskell was one of the largest individual stockholders in the Tide Water Associated Oil Co.

At organization meetings of both Tide Water Associated Oil Co. and Tide Water Oil Co., the retiring officers were reelected.

North Louisiana and Southern Arkansas Heavily Leased

By H. STANLEY NORMAN

SHREVEPORT, La., May 11.—The scramble for wildcat leases and geophysical search for likely producing areas in northern Louisiana and southern Arkansas gained momentum last week and brought scores of new operators to Shreveport.

Probably in no other portion of the Mid-Continent is such secrecy practiced in attempts of oil men to cover up their trails. Every trick of the trade is employed to deceive the inquisitive. However, every hotel lobby and street corner broker speaks with semblance of authority about who shot where, and what they found.

More geophysical crews are working in northern Louisiana and southern Arkansas than in any other part of the country. Nearly every important unit has one or more crews detailing some particular feature. There are approximately 20 shooting and torsion balance crews working in this territory for major companies, and magnetometer operators are numerous.

High prices for wildcat acreage prevailed last week in the old Blanchard shallow gas pool district where Pyramid Oil & Gas Co. and United Gas Public Service Co. deep "mystery" test is drilling. One tract a mile from the Blanchard area wildcat brought $100 per acre, the bulk of property changing hands on a basis of $50 per acre or less. Immediately southeast of the Blanchard wildcat on the south shore of Cross Lake and extending east nearly to Shreveport, acreage fringing on the Gulf Oil Oil Corp. block is selling for $10 per acre and under.

Landowners Greedy

Highest prices are being asked along the southwestern projection of the Rodessa fault in Cass, Marion and Harrison Counties. Arkansas Louisiana Gas Co.'s seismograph party continued shooting last week around American Liberty Oil Co. No. 1 Marcus Rambo, while Sinclair Prairie and Amerada did similar work in the general area. Atlantic Oil Producing Co. is using a multiple instrument torsion balance party in Cass, Marion and Harrison.

Standard Oil Co. of Louisiana has had a crew working in the southwestern corner of Miller County, Arkansas, for several weeks and last week the company was reported to have completed a block in Township 19n, Range 7w, in Bienville Parish, Louisiana. Gulf Oil Corp. parties are working north of Greenwood in western Caddo Parish, between Jonesboro and Lyons and in Jackson Parish.

Checkerboarding in Lafayette

Superior Oil Co. of California last week purchased a checkerboard lease spread in Lafayette County, Arkansas. Three companies, Phillips, Arkansas-Louisiana and H. L. Hunt, Inc., are sponsoring "shooting" operations in and around the old Smackover pool in Ouachita County, Arkansas, where Phillips completed a Permian lime discovery producer last week. Leases were placed on record last week by Roy A. Raines in sections 14, 15, 23, 26 and 21, Township 19n, Range 15w, just north of Shreveport in Caddo Parish, calling for spudding of a 6,000-foot test by July 12.

Drilling operations are scheduled to start by June 5 on the W. F. Hyde block of 4,000 acres centering on section 26-11-11, southeast of Mansfield in DeSoto Parish. Additional leases were reported taken last week by United Gas Public Service Co. in and around 8,000 acres the company has under lease centering on section 3-22-7e, west of Bonita in Morehouse Parish.

Scattered Purchases

Around the common corners of Sabine, DeSoto and Natchitoches Parishes, Hankins, Ford and Roscoe of Shreveport are negotiating for the drilling of a 3,000-foot test.

Sun Oil Co., H. L. Hunt, Inc., and Gulf Oil Corp. have been the most aggressive purchasers of acreage around the Homer pool in Caliborne Parish.

Roy Bolinger has acquired about 3,500 acres in Red River and Bayou Bodcaw in the northern part of Bossier Parish and continues to buy in that territory. The Sun company also has been active in acquiring about 2,000 acres in checkerboarded leases in Township 18, Range 1e, in Ouachita Parish, north of Calhoun and H. L. Hunt, Inc., has bought scattered protection around Cartersville in the same parish.

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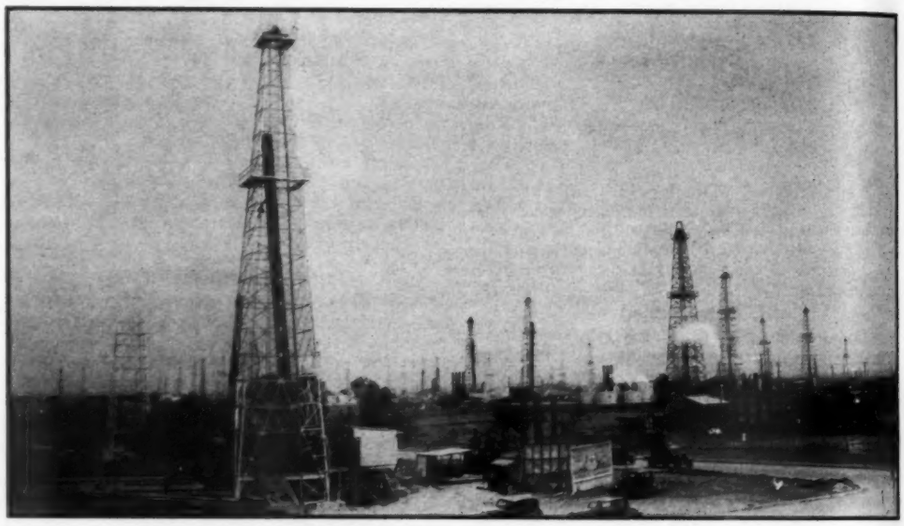

Spread of derricks in Oklahoma City north extension continues

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Upholds Back Pressure Method of Gauging Gas Wells

DALLAS, Tex., May 9.—The needlessness of blowing gas wells into the air and the paucity of the information gained by it were emphasized by J. H. Dunn, Dallas, and M. A. Abernathy, Houston, in reports on the U. S. Bureau of Mines back-pressure method of gauging gas wells to determine their open-flow or producing capacity at the convention here this week of the Natural Gas Department, American Gas Association.

"At one time," said Mr. Dunn, "most of us in the gas business thought it was necessary to open a gas well at regular intervals into the air to test the well or to keep in condition to produce gas. Most of us now believe it is seldom necessary or advisable to open a gas well to the air. I believe gas wells that are blown in regular operation are either blown unnecessarily or because of the absence of complete and adequate equipment. If it were necessary to open gas wells in regular operation, then I would not want to be the one whose duty it was to open some of our present 7,000-foot, 3,000-pound, 75,000,000-cubic-foot wells. These wells are being drilled and completed under pressure by methods developed from necessity to guard against the disastrous results of attempts to bring them into production otherwise. Wells such as those have forced us to consider ways of testing other than the old open-flow method. In the case of all other wells conservation demands a change. Open-flow testing actually gives us little information. The Bureau of Mines back-pressure method of testing gas wells yields a wealth of accurate information and provides a means of arriving at the true potential.

"In addition to the primary purpose of gauging gas wells without the necessity of blowing them, tests of this nature provide definite information concerning the availability of the gas supply. The tests further demonstrate the physical condition of wells. All the objections I have heard in connection with the testing of wells by this method can be satisfactorily answered."

"Our company has been experimenting with this method since it was devised about 1929," said Mr. Abernathy, "but it was not till about three years ago that we realized its numerous advantages and fully adopted it. We have conducted approximately 6,000 tests on all kinds of gas wells. We have materially benefited in various ways, such as saving gas wastage by this method as compared with the old Pitot tube method; by the use of curves plotted from the test data to show changes in the condition of the well; by the fact that except for this method we would have no way of testing the large number of wells in the Gulf Coast area, due to the character of the formation, which would prohibit the blowing of the wells to obtain a Pitot-tube reading. But we feel that the greatest benefit from this method is not in the determination of the open flow of the well, but in the determination of the present and future ability of a well to deliver gas into the pipe line against varying pressures, which we term the delivery capacity of the well.

"We have found that in most cases the open-flow capacity of the well can be determined with sufficient accuracy for all practical purposes by plotting the results of the test directly on log paper, using the observed well-head pressures without going into the involved calculations to carry the results back to the face of the sand. This method gives a direct reading of the well-head delivery capacity and the well-head open flow, which in the final analysis is the answer we want. This greatly simplifies the method and makes it of more practical benefit. In the case of large wells, where the size of the casing is a limiting factor in the rate of flow, this simplification is not applicable, and it is necessary to calculate the flow at the face of the sand and then to calculate the theoretical capacity of the casing in order to obtain well-head information.

"I feel that the data which can be obtained from back-pressure tests have a much wider application than heretofore has been given, particularly with respect to production problems, and that further study looking toward application of the method to wells producing both oil and gas will be of great help to the industry."

Ohio-Pennsylvania-Grade Producers Association Discuss Repressuring

By R. C. CONINE

COLUMBUS, Ohio, May 11.—Visualizing a doubling of their production at little increase in operating costs, Ohio Clinton Sand producers are preparing to go into gas repressuring en masse, it was revealed at the annual meeting of the Ohio Pennsylvania-Grade Oil Producers Association here. Three oil companies are conducting repressuring developments in the New Straitsville district with considerable success. Albert B. Craig, of Chartiers Oil Co., outlined his company's activities in secondary recovery work in the Clinton sand and the results presented left no doubt as to the success of repressuring. The Chartiers development is in New Straitsville. Preston Oil Co. is repressuring at Union Furnace, 11 miles from New Straitsville, and Murray City Oil & Gas Co. is repressuring 5 miles east of New Straitsville.

James Beery, chief of the Ohio division of mines, pointed out that while a clause in the mining law permits introduction of air or gas in an oil bearing formation, water flooding is specifically prohibited. A number of petroleum engineers, however, feel water drive would prove far more effective in the Clinton sand than gas repressuring, and agitation for a modification of the ban against water flooding is growing. Mr. Beery said in special cases, where large blocks of acreage are involved, or where releases from offset owners can be obtained, the Bureau of Mines might issue permission to waterflood. In general, the producers attending the meeting were disposed to let the law stand without change.

Philip Faine, secretary-treasurer of the association, said Ohio might follow Michigan in exempting oil and gas producing equipment from the state sales tax. Exemption is also sought from the excise tax on payrolls for the federal social security activity. Ohio has not passed a state social security law, but it is expected this legislation will be before the special session this summer. Pipe line and production taxes were also discussed. The producers contended gathering charges are too high.

Gas Repressuring

The Chartiers company repressuring development was started late in 1933. In New Straitsville district the Clinton is at an average depth of 3,295 feet, and the average thickness is 32 feet. The company used an old well, running the packer on the tubing above the sandstone.

Results

Large increases in gas and oil production and in rock pressure are recorded following repressuring. Gas measurements from eight wells in the development showed 13,000 feet production before repressuring, and 68,680 feet production today. Rock pressure before repressuring was 16 pounds and this has risen to 48 pounds today. In 1933 the volume of gas introduced was 29,440 feet. In 1934 gas introduced totaled 19,000,000 feet, and in 1935 this volume was increased by 376,000 feet. Today gas is being introduced at a rate of 55,000 feet a day under pressures ranging from 120 pounds to 140 pounds.

Oil Production

Fourteen wells affected by the pressure well, all more than 23 years old, showed the following response to gas repressuring:

Year	Output (bbls.)	Increase (bbls.)
1929	4,770.18	.....
1933	3,455.49	.....
1934	5,789.00	2,333.51
1935	7,281.95	3,826.46

Some of the wells showed much better results than others, the larger increases coming from wells registering higher gas yields. A few wells did not show an increase, but maintained production without decline. After cleaning wells with natural gasoline produced on the lease oil production increased sharply. Mr. Craig said wells half a mile away from the pressure well were affected. Total volume of gas introduced is slightly less than the volume taken out. Operating costs were considerably under those of previous stripper well operating.

Ohio Oil Structures

Dr. Wilbur R. Stout, Ohio state geologist, discussed geological oil structure in Ohio extemporaneously. Rocks in the state, he said, are continually dipping in one direction or another. The Cincinnati Arch, extending from northern Ohio to Alabama, is not a deformation arch, but depositional. The country is under subsidence less in west and fastest in east. Over the arch, subsidence was least resulting in a thickening of the beds. He noted a fault just west of Lake Erie, and small deformations in Adams County.

Production is along the eastern flank of the Cincinnati Arch. The formation is Trenton, part hard limestone and part dolomite. In the southwest part of Ohio the Trenton is hard limestone with little or no chance for oil production. The granite base is a terrace with a 2,000-foot drop. There is a slim possibility of production from basal sediments in contact with the granite at places where it lenses out. The horizon is in the St. Peter, from 15 to 20 feet above the granite. This infrequently paying stratum is a thin bed of porous dolomite with sufficient porosity in places. However, only three out of 100 wells drilled into this formation have been producers.

W. A. Irvin, president U. S. Steel Corp., will deliver opening address at International Petroleum Exposition, Saturday, May 16

Trenton Field

Trends in the Trenton field are N. 17° W. The field is in the northwest part of the state where the formation is a dolomite and goes into Michigan as a dolomite. The field has a southwest limit where the dolomite changes to a limestone. Play is northwest of the present field except for small extensions of the old pools.

Shallow Sands

There are numerous oil and gas producing sands at shallow depths in Ohio. These are a part of the Cambridge Arch caused by deformation at the time of Appalachian folding. The axis is large and flat from St. Marys, 40 miles wide, to Cleveland, 60 to 80 miles wide. The Parkersburg-Lorraine trough is wide and deep in the south and less so in the north. Terraces and noses, known as Ames terraces, feature the western syncline of the arch. This is the best area for finding oil by structural geology. There are good chances for production north of the present developed territory in Washington, Noble and Monroe Counties. The Berea, a wet sand, is found throughout eastern Ohio. This formation splits and the lower member is known as the Butler gas sand.

Oriskany

The Oriskany represents an old line of disconformity with patches deposited locally. There is no evidence of an outcrop of this sand in Ohio and the sand will probably be spotty. Structure is wiped out by thickening, and a big structure will be required to continue through the Oriskany, a wet sand. Keener sand pools appear on the steepest slope of terrace. The formation is lenticular and, as the Berea, does not fit structure. The shoestring character points to a filling of old stream beds with sand. Shale is found on the sides of these old streams. Ohio shale is found as a sheet thickening toward the southeast. The shale is a source bed and may be distilled profitably for oil and gas.

Russell B. Brown, of the Independent Petroleum Association of America, presented a review of national legislation problems affecting the industry. He outlined clearly dangerous trends revealed in depletion tax proposals, in stream pollution measures, and in large company views in connection with oil storage and imports.

Election of Officers

All of the officers and directors of the Ohio Pennsylvania Grade Oil Producers Association, were reelected. T. M. Bishop, Alexandria, president; E. J. Mildren, Marietta, vice president; Philip N. Faine, New Straitsville, secretary-treasurer; A. E. Faine, New Straitsville, statistician. Directors: W. Hunter Atha, Zanesville; T. M. Bishop, Alexandria; Oscar Blackburn, Steubenville; H. H. Brown, and Albert Craig, Pittsburgh, Pa.; C. B. Donahue, Logan; George Eggert, Lancaster; A. E. Faine, New Straitsville; W. L. Franks, Mount Pleasant, Mich.; John P. Flynn, and L. E. Gregg, Sistersville, W. Va.; J. P. Gordon, C. F. Huff, M. S. Lupher, and John H. McCoy, Columbus; William Harrington, Jr., E. J. Mildren, and Charles H. Vaughn, Marietta; H. J. Lowe, W. D. McIntire and James McCarty, Newark; J. J. Schmidt, Cleveland.

Natural Gasoline

California Production Declines

Natural gasoline production in California declined 2,000 bbls. to 36,000 bbls. daily, while refinery utilization increased 6,000 bbls. to 33,000 bbls. daily according to the Bureau of Mines report for the month of March. Total production during the month amounted to 1,115,000 bbls., or an average daily production of 36,000 bbls., as compared with 38,000 bbls. in February. Refinery utilization increased from 783,000 bbls. in February to 1,025,000 bbls. in March. Stocks dropped 52,000 bbls. during the month and were 1,897,000 bbls. at the end of the month, the latter figure being 1,008,000 bbls. under stocks of a year ago.

Total production for the first quarter of 1936 was 3,461,000 bbls., a daily average of 38,000 bbls., as compared with 3,040,000 bbls. for the first quarter of 1935. Refinery utilization for the first quarter likewise was higher than that of 1935; 2,733,000 bbls. compared with 2,118,000 bbls. in 1935.

Daily average production of liquefied petroleum gases increased from 1,093 bbls. to 1,340 bbls. of which 192 bbls. was produced at refineries in March. Daily average sales increased from 1,182 bbls. to 1,541 bbls.

Still gas production during March amounted to 1,672,425,000 feet, equivalent on a B.t.u. basis to 440,770 bbls. of fuel oil.

CALIFORNIA GASOLINE PLANT OPERATIONS

MARCH, 1936

Field—	Gas treated (thou. cu. ft.)	Natural gasoline produced (gallons)
San Joaquin Valley:		
Elk Hills	60,846	110,255
Kettleman Hills	10,216,052	12,256,745
Midway-Sunset	1,690,941	2,067,690
Mountain View	1,344,247	1,258,515
Miscellaneous	2,351,176	1,478,490
Coastal Region:		
Elwood	528,040	1,037,948
Rincon	61,343	114,797
Santa Maria	126,405	350,166
Ventura Avenue	2,896,409	4,173,370
Miscellaneous	52,210	267,999
Los Angeles Basin:		
Brea-Olinda and Coyote	536,611	1,494,093
Dominguez	1,298,397	1,733,513
Huntington Beach	2,026,512	3,330,848
Inglewood	210,416	277,221
Long Beach	2,130,612	7,575,487
Playa Del Rey	465,192	1,215,994
Richfield	293,706	362,256
Rosecrans	497,471	699,133
Santa Fe Springs	2,339,369	4,477,343
Seal Beach	456,707	674,821
Torrance	164,852	297,323
Miscellaneous	114,346	178,911
Total (all fields)	30,221,041	46,843,078

DISTRIBUTION (Gallons)

Stocks beginning of month	2,882,040	
Production during month	46,843,078	
Delivered to refineries		44,800,220
Delivered to jobbers, brokers or blenders		1,595,146
Blended at plants for production of motor fuel		7,393
Losses		35,386
Stocks end of month		2,286,973
Total	49,725,118	49,725,118

Liquefied pet. gas prod. .. 1,494,257 gals. = 35,578 bbls.
Motor fuel produced ..... 10,122 gals. = 241 bbls.

South Burbank Plant

Skelly Oil Co. is building a 10,000,000-foot natural gasoline plant in the South Burbank field of Oklahoma. Construction work is progressing fast and production is expected within the next month. The plant is expected to make from 20,000 to 25,000 gallons per day of raw gasoline and this will be transported by the company's pipe line to the company's Lyman plant where the gasoline will be further processed.

Turner Valley Waste Experiments

OTTAWA, Ontario, May 9.—At the annual meeting of the Canadian Institute of Mining and Metallurgy held here, a report by G. S. Whitby and A. Cambron of the National Research Council discussed the possible utilization of waste gas from the Turner Valley field.

The report stated that despite enforcement of conservation measures the gas flow in the Turner Valley field amounts to about 6,000 tons a day, of which the greater part is wasted. The gas is three-quarters methane or dry gas and one-quarter heavier stabilizer gas.

Experiments with the stabilizer gas have been the most successful in economic possibilities. By fractionation, the stabilizer gas can be made to yield a proportion of liquid fuel. Experiments showed it was possible to obtain nearly 3 gallons of natural gasoline from 1,000 feet of gas.

Under other conditions, stabilizer gas could be converted by heating into reactive olefin gas. From this, synthetic ethyl alcohol, isopropyl, butyl alcohols and ethylene glycol could be made. Butyl alcohols are used in the manufacture of lacquer, and ethylene is a nonevaporating antifreeze and a raw material for nonfreezing dynamite.

Revamping Panhandle Plant

Skelly Oil Co. has recently completed the construction work on revamping the natural gasoline plant near Skellytown in the Panhandle formerly known as the S. L. Lubell plant. At the present time the new equipment is operating at a rate considerably below capacity but will be stepped up to make close to 15,000 gallons daily, the stated capacity of the revised unit.

Alberta Absorption Plant

CALGARY, Alberta, May 9.—The new gasoline absorption plant of the British-American Oil Co., now under construction in the South Turner Valley field, will be in readiness for operation by June 15. It will have a processing capacity of 60,000,000 feet of gas per day.

Natural Gas News

Southwestern Gas Officers

SHREVEPORT, La., May 9.—Officers of Southwestern Gas & Electric Co. were elected at a meeting in Texarkana, the first since directors were named at a meeting of stockholders held on April 21. The directors reelected A. Lieberman, Texarkana, as president, and M. T. Walker, Shreveport, as vice president. Other officers reelected were: W. E. Bann, Texarkana, vice president; E. H. Wilson, Shreveport, secretary; H. L. Nickerson, Shreveport, treasurer and assistant secretary; J. F. Carroll, Shreveport, assistant treasurer, and L. R. Williams, Shreveport, auditor.

Directors elected at the stockholders' meeting were: W. E. Bann, Knox Lee, Marshall; A. Lieberman, H. L. Nickerson, M. T. Walker, L. R. Williams and R. M. Winsborough, Shreveport.

Lambeth Rate Conference

LAMBETH, Ontario, May 9.—A conference was held here recently between local gas consumers and representatives of Southern Ontario Gas Co. at which tentative steps were taken toward the drafting of a new rate agreement.

Community Case Continued

OKLAHOMA CITY, May 11.—The State Corporation Commission has continued indefinitely its hearing in the reopened contest with the Community Natural Gas Co. over rates in 26 southern Oklahoma towns.

A demurrer filed by the commission attorney, J. B. A. Robertson, against a response filed by the Community Natural to a citation, will be argued further at the next hearing.

The commission refused to act immediately upon Robertson's demurrer after C. C. Hatchett, attorney for Community, had argued upholding the demurrer would deprive the company of its property without due process and constitute a violation of the state and federal constitutions. He argued that to sustain the demurrer would in effect be rendering judgment in the case without hearing any evidence.

MOTORIZED ATTACK ON OKLAHOMA CITY TRENCH FAILS

LUNCH BOX ONLY CASUALTY IN CONFLICT

The car at the right had just driven up on the parking in an attempt to obstruct the laying of a 24-inch high pressure gas line in Oklahoma City by crossing the ditch, but the men kept on digging. The property owner is seen getting out of the car to order the work stopped, but the work went on.

The car at the left had been chained to the cottonwood tree with a threat posted on the windshield. A few minutes later another car drove up to the ditch almost hitting two men and smashing a lunch box—a good signal for a fight any time on a pipe line. The disturbers wound up by paying for the man's lunch. It was pointed out they had broken several laws and city ordinances. They unchained the car and withdrew all their forces.

Pipe Line Activity

Gulf Line From Altus

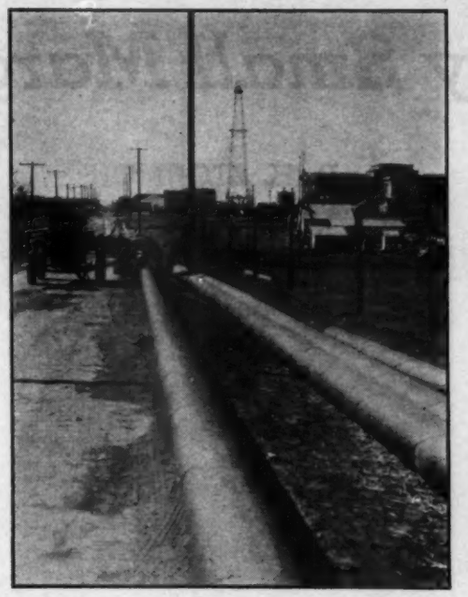
Gulf Pipe Line Co. has started survey for a pipe line from the Altus field in Jackson County, Oklahoma, south through the Tipton pool in the same county, to connect with its lines at Burkburnett, Tex. Plans for construction of the line still are tentative, and are dependent upon a further study of the production possibilities of the Tipton area, it was said. Production in the Altus field, where small producers are completed in Granite Wash, was not considered sufficient to justify construction of the line. Larger and deeper production from Cisco lime wells in the Tipton area, however, will justify the line unless water intrudes too rapidly, it was thought. Size of the pipe has not been announced. It will be the first line to enter the Jackson County areas, the oil now being taken in trucks and tankcars to the Gulf lines at Burkburnett.

Construction in California

LOS ANGELES, Calif., May 11.—Projected pipe line construction in California will result in the expenditure of $6,000,000 during 1936 and require approximately 30,000 tons of pipe ranging in diameter from 6 to 12 inches. Of this, $4,500,000 will be used in the construction of Shell Oil Co.'s new Martinez-Bakersfield line and $1,500,000 for construction of a new pipe line by Valley Pipe Line Co. from Kettleman Hills to tidewater at Estero Bay in San Luis Obispo County. Contracts for the construction of the 10-inch pipe line from Kettleman Hills to Estero Bay were awarded a few days ago to Lang Transportation Corp. by Valley Pipe Line Co. This line, 70 miles long, will cost approximately $1,500,000 and have a daily capacity of 15,000 bbls. Plans call for completion on or before August 1. Valley Pipe Line Co. was organized Monday, May 4, 1936, as a closed corporation. It is capitalized at $2,000,000 and the stock is held equally by Texas Co. and Seaboard Oil Corp. Officers are C. P. Watson, president; L. R. Holmes, vice president; W. A. Russell, treasurer; Paul Ballengee, assistant treasurer; A. W. Mitchem, secretary, and C. H. Montgomery, assistant secretary. Watson, Russell and Mitchem represent Seaboard Oil Corp., while Holmes, Ballengee and Montgomery represent Texas Co.

The route to be followed by the Valley Pipe Line Co. installation will be approximately the same as that followed by Standard Oil Co. Only two pump stations will be required and as it is not the intention to store any oil along the line, tankage will be erected only at Estero and Kettleman, where four steel tanks, with a capacity of approximately 118,000 bbls. each, will be erected. The submarine loading line will approximate 2,500 feet in length. Seaboard Oil Co. and Texas Co. have been considering the advisability of building this line for several months. The matter came to a head last October, when inadequate pipe line facilities prevented the Kettleman North Dome Association from obtaining maximum production when the Kettleman North Dome field was supposed to be producing wide open. This field has never produced wide open but was producing as much as the outgoing pipe lines could handle. Sumner C. Bryant, a member of Texas Co. legal staff, was loaned to Valley Pipe Line Co. a few months ago to facilitate incorporation of the new company and consolidate activities.

Completion of the Shell projected pipe line from Bakersfield in Kern County to Martinez will enable the company to move approximately 40,000 bbls. of San Joaquin Valley crude to tidewater on San Francisco Bay, where it has refining and marketing facilities. This is of interest because of the probability the greater part of California's future production will come from the San Joaquin Basin and because Shell is prevented by law from using its tanker fleet to transport crude or refined oil in statewide or interstate commerce. Shell has indicated rather definitely it will restrict its purchase of crude and rely almost entirely on its own crude reserves. The company has considerable production shut in which it can use to advantage by restricting purchases. General Petroleum may at some future date lay a new pipe line out of the San Joaquin Valley but for the present has ample facilities. This company reconditioned part of its old line last year and laid 89 miles of new line from Lebec to its Torrance refinery in Los Angeles Basin. Several years ago General Petroleum purchased 300 acres of land adjacent to tidewater at Estero Bay in order that it would provide the necessary facilities whenever it was found advantageous to lay a new line westward to the coast. Up to the present the company has not made any move to use this acreage as its line from Kettleman North Dome and Lost Hills-Belridge to Los Angeles Basin has proved very efficient.



Laying gas lines in street near governor's mansion in north extension of Oklahoma City oil field

Placedo Pipe Line Contract

HOUSTON, Tex., May 11.—Barnsdall Pipe Line Co. has awarded Apex Construction Co. of Houston the contract for the laying of approximately 12 miles of 3-inch welded oil line from the Placedo field in Victoria County to the Wood-Moore refinery at Port Lavaca in Calhoun County. This is the first pipe line outlet for the field.

Union Sulphur Co. 15-mile welded 6-inch line from the Gillis field in Calcasieu Parish to the company's tank farm at Sulphur is 40 per cent completed and is scheduled to be in operation within 10 days.

Texas Pipe Line Co.'s 9-mile 6-inch welded oil line from the Garden Island field in Plaquemine Parish, Louisiana, to Pilot Point is completed and is now in operation. The oil is taken by deep water tankers at Pilot Point and shipped to the company's refinery at Port Arthur.

American Liberty Line

FORT WORTH, Tex., May 11.—American Liberty Pipe Line Co., which has just completed constructing a gap of 8-inch line between the Conroe field in Montgomery County, connecting with the Liberty Pipe Line Co. southern terminus at its Rusk station in Cherokee County, giving the East Texas field the first Gulf Coast outlet by an independent pipe line company, started running oil through the line this week.

The line has a capacity of around 30,000 bbls. per day, part of which will be run from the East Texas field and part from the Conroe field. Six pumping stations are located along the line to boost the oil to the Gulf terminal at Houston. The company owns its own gathering system in the field and will also take oil from other independently owned gathering systems there.

Michigan Gas Lines

MUSKEGON, Mich., May 11.—Delivery of natural gas from the tri-townships field, central Michigan, through the 70-mile 10-inch pipe line recently completed was started last week by Consumers Power Co. in Lansing, state capital.

Construction of another 10-inch line from the same field to Grand Rapids is being rushed to completion.

Refinery Projects

Rodessa Reconditioning Plant

SHREVEPORT, La., May 11.—Expenditure of $100,000 for new equipment and repairs is under way at the recently acquired Crystal Refining Co., Cedar Grove, Caddo Parish, plant by the purchaser, Rodessa Oil & Refining Co., of which M. J. Grogan is president and B. P. Crittenden, vice president. Negotiations for purchase of the refinery were consummated for $120,000 April 1 after Rodessa Oil & Refining Co. had operated it on a lease basis for several months.

Since the purchase the new owners have replaced or reconditioned all unserviceable equipment from tank roofs to sewer lines and on May 5 broke ground for construction of a cracking unit and a pressure distillation stabilizer and a vapor recovery system. Construction work on the cracking still and the stabilizer will be completed and the equipment placed in operation by July 1, according to plans of the company.

The plant has capacity of 7,500 bbls. per day, but at present is being operated on about 3,800 bbls. of crude daily. Operators have no plans for immediate increase of the rate of charges to stills. Approximately 500,000 bbls. of oil have been processed through the Rodessa plant since it assumed operation of the old Crystal property on a lease basis and since the purchase in April.

The Rodessa company has assured itself of a long term crude supply by negotiating a contract for 1,000,000 bbls. during remainder of 1936 from the Haynesville, La., and Stephens County, Arkansas, districts. The crude is to be delivered from Stephens County to Haynesville, La., by the Ohio Oil Co. pipe line facilities and from Haynesville to the Cedar Grove plant via Louisiana Oil & Refining Co. transportation system.

The new pressure distillation stabilizer and vapor recovery system to be constructed within the next two months will operate on 300 pounds pressure. The cracking still is to be operated with turbine driven centrifugal pumping units with low pressure steam power.

Canadian Oil Refineries

PETROLIA, Ontario, May 9.—Following completion last year of a new cracking unit at a cost of approximately $500,000 for its refinery here, Canadian Oil Refineries, Ltd., is improving its facilities for bringing in crude. C. A. Hale, superintendent, has announced that $28,000 will be spent in extending dock facilities at Froomfield on the St. Clair River and building a 25,000-gallon storage tank. Approval of the federal marine department is being asked for any necessary dredging. The new equipment includes a 35-foot dock with unloading equipment.

Crude will be pumped from Froomfield to Petrolia by pipe line. The old pumping station, in operation nearly 50 years, was shut down two years ago, since then crude has been brought in by railroad and pipe line from the Michigan, Louisiana, Mid-Continent, Texas and Indiana fields. In future most of the crude will be brought in from the Mid-Continent. The pumping equipment and lines will be renewed and modernized. James Warwick for the past two years with the Petrolia refinery, has been again placed in charge of the pumping station.

Mid-Continent Crude Run Schedules Reduced by Small Margin in May

By D. H. STORMONT

According to estimates made at the first of the month, crude runs to stills in the Mid-Continent refining area are being held on about the same level as those of April, the increase for the whole area amounting to about 6,700 bbls. daily. While the total runs are being increased to 513,510 bbls. daily, approximately 47,500 bbls. more than the total of May, 1935, the districts comprising the Mid-Continent differ somewhat in their courses. East Texas shows the substantial decrease of 6,900 bbls. while Oklahoma has a total increase of 9,080 bbls. daily. North Louisiana is another district to show a decrease and according to estimates is curtailing runs 3,550 bbls. daily. In Arkansas, North Central Texas, and Southwest Texas the total runs are approximately the same as those of the preceeding month. In Kansas, schedules are being continued without change in most cases, with some of the larger refineries operating at slightly higher figures and thus accounting for the increase of 3,570 bbls.

East Texas

Only a few changes took place in the East Texas district during the past month, the number of refineries operating remaining practically the same and but few reopening or shutting down. The decrease in runs to stills for the large part was due to some of the larger plants curtailing their daily runs and not because of new plants closing. Danciger Refineries, Inc., after reopening its Longview plant last month reported that daily runs to stills would approximate 3,000 bbls. during the present month. The former Trio Refining Co. of Arp is now operating as the Hurricane Petroleum Corp., Arp. Refinery.

Another refinery is being planned for the Rodessa area, that of the Quality Refining Corp., headed by H. D. Easton, Jr., of Shreveport. The plant is to be constructed at Ida, Caddo Parish, and will have a daily skimming capacity of 700 bbls. East Texas Petroleum Corp. also recently completed its new skimming plant in the Rodessa field in way of new plant construction in that area. Rodessa Oil & Refining Corp. after operating under lease the Cedar Grove, La., refinery of the Crystal Refining Co. since last September recently announced the purchase of the plant. It is reported that the operators will install additional cracking equipment in way of further modernizing the plant in the near future.

Mid-Continent Crude Runs

Average Daily (Barrels)

(Advance estimate compiled by The Oil and Gas Journal)

	1934	1935	1936
January	448,360	426,070	501,600
February	456,619	448,810	519,960
March	465,680	451,510	478,760
April	458,220	467,765	*506,775
May	457,165	466,015	513,510
June	459,908	485,015	.....
July	477,012	494,210	.....
August	501,750	508,960	.....
September	499,830	541,080	.....
October	500,755	523,620	.....
November	500,445	524,475	.....
December	440,735	511,025	.....

*Corrected.

Operations by Refinery Districts

Daily crude runs

	May	April	Inc.
Arkansas	21,900	21,400	500
East Texas	54,105	61,005	*6,900
Kansas	119,510	115,940	3,570
N. Central Texas	44,050	43,425	625
North Louisiana	38,800	42,350	*3,550
Oklahoma	156,335	147,255	9,080
Southwest Texas	19,310	18,650	660
W. Tex.-Panhandle	59,500	56,750	2,750
Total	513,510	506,775	6,735

*Decrease.

Oklahoma

The Okmulgee refinery of the Barnsdall Oil Co. resumed operations the first of the month after being closed since the first of the year and will operate at approximately 3,000 bbls. capacity during the month. The remainder of the 9,000-bbl. increase in Oklahoma is accounted for by increases in refining schedules of many of the larger companies.

Despite heavy stocks of motor fuel in the Mid-Continent area refiners generally have made a pronounced advancement economically since May 1, 1935. At that time the total crude capacity of the area was 1,062,250 bbls. daily with crude runs totaling 466,015 bbls. daily. On the first of the present month total daily capacity of the same area was 1,077,750 bbls., an increase of 15,500 bbls., with daily crude runs estimated at 513,510 bbls. With the exception of the past March, this situation has held all through the winter season when runs are usually curtailed. Not only have the runs been held at a high level but also the prices received for refined products have been consistently higher, average refinery price of regular U. S. Motor Group 3 gasoline for the first quarter of 1936 being 6 cents as compared with 4.5 cents for a like period of 1935. The above statements are further emphasized by the first quarter reports of many oil companies in that their earnings were much greater. Therefore with continued good motoring season gasoline consumption should surpass the record established last year and refiners realize greater earnings during the year than in any other in the past seven years.

Estimated Daily Average Mid-Continent Refinery Crude Runs for May

ARKANSAS

Company and location—	Daily capacity	Av. daily runs— May	April
Berry Asphalt Co., Waterloo	2,000	1,200	1,200
Henry H. Cross Co., Smackover	4,000	4,000	4,000
Lion Oil Ref. Co., El Dorado	12,000	9,000	9,000
Macmillan Pet. Products Co., Norphlet	2,500	2,000	2,000
Ouachita Valley Ref. Co., El Dorado	2,500	(*)	(*)
Root Pet. Co., El Dorado	1,200	5,000	5,000
Simms Co., Smackover	3,000	(*)	(*)
Stephens Ref. Co., Stephens	750	200	200
Total	40,750	21,900	21,400

*Shut down.

KANSAS

Company and location—	Daily capacity	Av. daily runs— May	April
Barnsdall Oil Co., Wichita	4,000	3,000	3,000
Chase Ref. Co., Chase	1,000	800	800
Cusco Oil & Ref. Co., Chase	3,100	(*)	(*)
Derby Oil Co., Wichita	8,000	4,600	4,600
Dickey Ref. Co., McPherson	2,500	1,700	1,700
Eldorado Ref. Co., Eldorado	5,000	3,800	3,500
Falcon Ref. Co., Inc., Great Bend	800	700	500
Globe Oil & Ref. Co., McPherson	12,000	7,000	7,000
Kanotex Ref. Co., Arkansas City	12,000	6,500	5,000
Kansas Gasoline Co., Winfield	150	25	25
Krueger Ref. Co., Laton	150	50	50
National Ref. Co., Coffeyville	8,000	5,000	5,000
Pet. Products Co., Chanute	1,000	800	800
Phillips Pet. Co., Kansas City	13,000	13,225	12,165
Russell Ref. Co., Russell	2,500	800	800
Shell Petroleum Corp., Arkansas City	20,000	18,000	18,000
Sinclair Ref. Co., Coffeyville	20,000	7,000	7,000
Sinclair Ref. Co., Argentine	11,000	7,000	7,000
Skelly Oil Co., Eldorado	22,000	17,000	17,000
Socony-Vacuum Oil Co., Inc., Augusta	16,000	15,000	15,000
Standard Oil Co., (Indiana), Neodesha	20,000	4,500	4,500
Vickers Pet. Co., Potwin	3,500	3,000	2,500
Total	183,700	119,510	115,940

*Shut down.

OKLAHOMA

Company and location—	Daily capacity	Av. daily runs— May	April
Anderson-Prichard Oil Corp., Cyril	5,000	4,500	4,500
Associated Pet. Corp., Allen	8,000	(*)	(*)
Barnsdall Oil Co., Barnsdall	6,000	3,500	3,500
Barnsdall Oil Co., Okmulgee	10,000	3,000	(*)
Bell Oil & Gas Co., Grandfield	4,500	2,000	2,000
Black Gold Ref. Co., Oklahoma City	3,000	1,500	1,500
Century Pet. Corp., Oklahoma City	2,500	(*)	(*)
Champlin Ref. Co., Enid	16,000	6,000	6,000
Continental Oil Co., Ponca City	30,000	25,800	22,500
Crescent Ref. Co., Holdenville	1,000	(*)	(*)
Cushing Ref. & Gasoline Co., Blackwell	1,700	1,500	1,500
Cushing Ref. & Gasoline Co., Cushing	6,200	2,500	2,500
Deep Rock Oil Corp., Cushing	10,000	9,000	9,000
Eason Oil Co., Enid	5,000	2,800	2,700
Empire Oil & Ref. Co., Okmulgee	4,000	2,500	2,500
Empire Oil & Ref. Co., Ponca City	12,000	9,000	9,000
Globe Oil & Ref. Co., Blackwell	8,000	3,000	3,000
Government Ref. Co., No. 3, Seminole	800	(*)	(*)
Johnson Oil Ref. Co., Cleveland	6,000	4,000	4,000
Marathon Oil Co., Bristow	5,000	2,580	2,665
Mid-Continent Pet. Corp., West Tulsa	40,000	18,000	18,000
Monarch Ref. Co., Oklahoma City	2,000	900	900
Olympic Ref. Co., Oklahoma City	2,500	(*)	(*)
Omar Ref. Co., Garber	8,000	2,500	2,500
Paramount Ref. Co., Oklahoma City	2,000	(*)	700
Peacock Ref. Co., Oklahoma City	2,000	(*)	(*)
Peppers Gasoline Co., Oklahoma City	500	200	200
Phillips Pet. Co., Okmulgee	6,000	4,030	4,165
Pure Oil Co., Muskogee	10,000	8,000	8,665
Rock Island Ref. Co., Beckett	6,000	2,500	2,500
Sinclair Ref. Co., Sand Springs	8,000	2,000	2,000
Sinclair Ref. Co., West Tulsa	6,000	(*)	(*)
Sooner State Ref. Co., Oklahoma City	700	400	400
Sun Oil Co., Yale	5,000	2,000	2,000
Sunray Oil Co., Allen	7,000	3,290	3,100
Texas Co., West Tulsa	15,000	11,000	11,000
Tide Water Oil Co., Drumright	15,000	12,000	10,000
Triangle Prod. & Ref. Co., Oklahoma City	1,500	1,200	1,100
S. L. West Ref. Co., Oklahoma City	1,000	200	200
Wilcox Oil & Gas Co., Bristow	6,000	1,935	2,160
Wirt Franklin Pet. Corp., Ardmore	4,000	(*)	(*)
Yale Oil Corp., Yale	2,000	(*)	(*)
Total	295,900	156,335	147,255

*Shut down.

NORTH LOUISIANA

Company and location—	Daily capacity	Av. daily runs— May	April
Acme Ref. Co., Monroe	100	50	50
Atlas Pipe Line Co., Shreveport	12,500	7,500	10,000
Bayou State Oil Corp., Houston	750	300	350
Griswold Refineries, Shreveport	2,500	1,500	1,500
Griswold Refineries, Sandra	5,000	2,000	2,000
Louisiana Oil Ref. Co., Bossier City	25,000	21,000	21,000
Pelican Ref. Co., Converse	100	50	50

"TUBE-TURNS MADE IT EASY!"

HERE'S just one small job which perfectly illustrates *several* advantages of Tube-Turns★. In the first place, both the odd-angle 130° fitting and the 45° elbow were cut from one 180° Tube-Turn! This was easily possible only because Tube-Turns have uniform wall-thickness at all points . . . . The full cross-section and the easy sweeping radius of these Tube-Turns will permanently reduce pumping costs . . . . The neatness, compactness and light weight of this Tube-Turn job speak for themselves. May we send you *all* the facts about Tube-Turns? Address: Tube-Turns, *Incorporated*, Herald-Post Building, Louisville, Kentucky.

★ The word "Tube-Turn" is NOT a general name for welding fittings. Tube-Turns are THE seamless fittings having uniform wall-thickness at all points, true circular cross-sections, uniform radius of curvature and smooth inner walls. Made ONLY by Tube-Turns, Incorporated.

Company and location—	Daily capacity	Av. daily runs May	Av. daily runs April
Bodcaw Oil & Ref. Corp., Cedar Grove	7,500	3,300	3,300
Shreveline Oil Co., Lewis	1,000	600	600
Stanolind Oil & Gas Co., Superior	4,500	2,000	2,000
Texas Co., Shreveport	7,000	(*)	(*)
Total	65,950	38,800	42,350

*Shut down.

EAST TEXAS

Acme Ref. Co., Longview	1,250	(*)	(*)
Admiral Ref. Co., Kilgore	2,500	640	1,700
Ardell Ref. Co., Gladewater	1,250	(*)	(*)
Artex Ref. Co., Arp	1,200	(*)	(*)
Ash Ref. Co., Gladewater	1,500	160	(*)
Bartlett Ref. Co., Kilgore	2,500	(*)	(*)
Beacon Ref. Co., Henderson	4,000	(*)	(*)
Caddo Ref. Co., Camp Switch	1,000	(*)	(*)
Cascade Ref. Co., Reeds Switch	3,000	1,000	1,150
Central Ref. Co., Gladewater	2,000	200	220
Century Ref. Co., Friars Switch	2,500	(*)	(*)
Chief Ref. Co., Gladewater	2,000	80	1,370
Clay Ref. Co., Arp	2,500	1,000	1,720
Danciger Refineries, Inc., Longview	10,000	3,000	3,500
Deason Ref. Co., Turnerstown	500	(*)	(*)
Dominant Ref. Co., No. 1, Kilgore	4,000	(*)	(*)
Dominant Ref. Co., No. 2, Kilgore	2,000	(*)	(*)
East Texas Ref. Co., Longview	20,000	6,130	5,000
Elk Ref. Co., Kilgore	4,000	(*)	(*)
G. & P. Ref. Co., Overton	1,000	(*)	(*)
Gilliland Ref. Co., Gladewater	4,000	2,580	2,850
Gilliland Ref. Co., Overton	6,500	2,205	2,415
Glade Ref. Co., Gladewater	1,000	(*)	(*)
Goodson Ref. Co., Gladewater	1,000	(*)	(*)
Hub Oil Ref. Co., Reeds Switch	750	(*)	(*)
Hurricane Pet. Corp., Overton	4,500	2,655	4,200
Hurricane Pet. Corp., Arp Ref., Arp	3,000	1,775	850
H. L. Johnson Ref. Co., Kilgore	1,000	(*)	(*)
Keystone Ref. Co., Gladewater	1,000	(*)	(*)
Kilgore Reclamation Co., Kilgore	2,000	(*)	(*)
Kil-Tex Ref. Co., Kilgore	1,000	(*)	(*)
Lago Ref. Co., Gladewater	2,500	370	1,580
La Petite Ref. Co., Henderson	900	(*)	(*)
La Pren Ref. Co., Kilgore	2,500	(*)	(*)
London Topping & Ref. Co., Overton	1,000	(*)	(*)
Lotus Ref. Co., Gladewater	1,750	(*)	(*)
McMurrey Ref. Co., Arp	4,000	440	1,250
Magnolia Pet. Co., Corsicana	5,000	4,000	4,000
Master Pet. Co., Waco	1,000	(*)	(*)
Morgan Ref. Co., Camp Switch	1,000	(*)	(*)
Matthews Ref. Co., Gladewater	1,000	(*)	(*)
North Texas Ref. Co., Gladewater	1,500	(*)	(*)
Ocean Pet. Corp., Kilgore	3,000	1,985	1,830
Outdoor Ref. Co., Kilgore	900	(*)	(*)
Overton Ref. Co., Overton	3,000	(*)	(*)
Ozozo Ref. Co., No. 1, Friars Switch	7,500	(*)	(*)
Ozozo Ref. Co., No. 2, Overton	10,000	(*)	(*)
Panama Ref. Co., Kilgore	3,000	470	1,000
Petroleum Cracking Corp., Camp Switch	4,200	(*)	(*)
Premier Oil Ref. of Texas, Greggton	4,000	2,635	3,000
Producers Oil & Ref. Co., Kilgore	3,000	(*)	(*)
Rusk Oil & Ref. Co., Overton	4,000	1,000	550
Sabine Ref. Co., Gladewater	500	(*)	(*)
Saxet Ref. Co., Gladewater	1,500	50	(*)
Sinclair Ref. Co., Camp Switch	3,500	2,030	2,000
Smith Ref. Co., Gladewater	1,500	(*)	(*)
Solvex Refineries, Inc., Gladewater	4,500	2,120	3,000
Southern Oil Ref. Co., Reeds Switch	2,000	(*)	(*)
Southport Pet. Co., Kilgore	5,000	1,730	1,650
State Ref. Co., Kilgore	500	(*)	(*)
Superior Ref. Co., Kilgore	1,000	(*)	(*)
Supreme Ref. Co., Gladewater	1,000	(*)	(*)
Swastika Ref. Co., Kilgore	2,200	(*)	250
Texas Co., The, Dallas	16,000	8,000	8,000
Texas National Ref. Co., Gladewater	1,500	155	(*)
Texas Oil Products Co., Longview	3,000	1,570	2,370
Trinity Ref. Co., Gladewater	6,000	1,950	2,150
Tower Ref. Co., Overton	2,000	1,955	1,900
Tyler Tex. Ref. Co., Tyler	10,000	1,370	950
Union Ref. Co., Kilgore	3,000	(*)	(*)
Upshur Ref. Co., Gladewater	750	(*)	(*)
Utah Ref. Co., Kilgore	3,000	(*)	(*)
View Ref. Co., Kilgore	2,000	(*)	(*)
Wabash Ref. Co., Gladewater	250	250	440
Western Ref. Co., Gladewater	1,500	(*)	(*)
Western States Ref., No. 2, Kilgore	3,000	(*)	(*)
Youth Ref. Co., Big Sandy	1,000	(*)	(*)
Total	237,250	54,195	61,995

*Shut down.

NORTH CENTRAL TEXAS

Allstate Ref. Co., Thrall	2,500	(*)	(*)
Baird Ref. Co., Baird	1,500	1,300	1,300
Canyon Oil & Gas Co., Inc., Cisco	500	(*)	(*)
Continental Oil Co., Wichita Falls	6,000	4,000	3,900
Empire Oil & Refining Co., Gainesville	5,000	(*)	(*)
Exchange Pet. Corp., Albany	300	300	250
Falls Ref. Co., Wichita Falls	2,000	300	300
Gratex Ref. & Fuel Oil Co., Graham	300	300	185
Gulf Ref. Co., Fort Worth	10,000	5,000	5,000
Gulf Ref. Co., Sweetwater	7,500	4,500	4,500
Haskell Oil Ref. Co., Breckenridge	200	(*)	(*)
Hightower Oil & Ref. Corp., Brownwood	750	200	300
Hill Ref. Co., Ballinger	50	50	50
Imperial Gas Corp., Fort Worth	1,200	300	300
Jacksboro Ref. Co., Jacksboro	50	50	50
La Salle Pet. Co., Burkburnett	2,500	800	750
Magnolia Pet. Co., Fort Worth, No. 1	12,000	5,000	5,000
Marathon Oil Co., Fort Worth	5,000	4,000	4,320
Moutray Oil Co., Hawley	1,200	800	760
Muenster Ref. Co., Abilene	300	(*)	(*)
New Deal Ref. Co., Abilene	300	(*)	(*)
Nolting Ref. Co., Sweetwater	1,000	(*)	(*)
Norgold Ref. Co., West Olney	400	200	200
Olney Oil & Ref. Co., North Olney	2,500	1,800	1,800
Omega Ref. Co., Brownwood	200	(*)	(*)
Onyx Refining Corp., Hawley	1,200	1,000	900
Panhandle Ref. Co., Wichita Falls	4,000	2,700	2,200
Panhandle Ref. Co., Leuders	600	600	500
Pilot Point Ref. Co., Pilot Point	500	100	100
Sinclair Ref. Co., Fort Worth	5,000	3,000	2,000
Southtex Ref. Co., Trent	250	(*)	(*)
Southland Ref. Co., Megargel	500	200	200
Southland Ref. Co., Olney	1,000	(*)	(*)
Starlight Ref. Co., Inc., Ballinger	500	400	400
Superior Ref. Co., Tiffin	500	(*)	(*)
Taylor Ref. Co., Taylor	6,000	800	800
Taxman Ref. Co., Wichita Falls	3,500	2,500	2,500
Texas Pacific Coal & Oil Co., Caddo	1,000	700	700
Tucker Ref. Co., Wichita Falls	250	150	150
Wagoner Ref. Co., Electric	6,000	3,000	3,000
Total	97,680	44,050	43,425

*Shut down.

WEST TEXAS AND PANHANDLE

Active Oil Co., Arno	1,500	(*)	(*)
Aero Ref. Co., Pecos	220	100	100
Coltex Ref. Co., Colorado	12,500	8,000	8,000
Concho Ref. Co., San Angelo	250	100	100
Conden Oil Co., Big Spring	10,000	8,500	8,000
Danciger Refs., Inc., Pampa	6,500	5,000	5,000
Gibson Oil Corp., Magic City	250	100	100
Howard County Ref. Co., Big Spring	2,500	600	600
McNutt Ref. Co., El Paso	2,000	750	750
Panhandle Ref. Co., Kings Mill	2,000	1,700	1,500
Paramount Pet. Co., San Angelo	2,000	(*)	(*)
Phillips Pet. Co., Borger	50,000	19,350	18,000
Shamrock Oil & Gas Corp., Sunray	2,500	1,500	2,000
Shamrock Oil & Gas Corp., Meldavis	1,500	1,500	1,500
Sinclair Ref. Co., El Paso	4,000	(*)	(*)
Standard Oil Co. of Texas, El Paso	14,000	7,700	6,500
Texas Co., El Paso	2,000	1,000	1,000
Texas Co., Amarillo	4,000	3,000	3,000
West Texas Ref. Co., Pecos City	6,000	(*)	(*)
Western Ref. Co., Mertzon	100	(*)	(*)
Western Ref. Co., Baldridge	1,000	(*)	(*)
Wickett Pet. Co., Wickett	2,500	600	600
Total	127,420	59,500	56,750

*Shut down.

SOUTHWEST TEXAS

Amsco Ref. Co., Mirando City	4,500	3,500	3,900
Humble Oil & Ref. Co., San Antonio	5,000	3,000	3,000
Magnolia Pet. Co., Luling	7,000	4,000	4,000
Midway Oil & Ref. Co., Pettus	1,000	500	500
Pettus Ref. Co., No. 1, Pettus	1,000	900	700
Pettus Oil & Ref. Co., No. 2, Pettus	1,000	750	750
Pettus Ref. Co., Mathis	1,000	500	500
Phoenix Ref. Co., San Antonio	1,200	1,200	1,300
Phoenix Ref. Co., Bruni	900	400	400
Pioneer Oil & Ref. Co., Somerset	2,000	1,300	1,300
Rado Ref. & Prod. Co., McAllen	500	200	200
Texas Co., San Antonio	3,000	3,000	2,500
Valley Ref. Co., Harlington	1,000	60	600
Total	29,100	19,310	18,650

*Shut down.

HUGH G. TRIMBLE

Hugh G. Trimble has become associated with the Muskogee Iron Works and will serve this company as special sales representative. He has already opened offices in the Thompson Building, Tulsa. Mr. Trimble is one of the most widely known and popular men in the equipment end of the oil industry. He will continue to live in Tulsa, in which city he has resided for several years.

New York-Pennsylvania Gas

COUDERSPORT, Pa., May 11.—There were two good completions in the Pennsylvania-New York Oriskany gas sand fields during the week ending May 9. Belmont Quadrangle Development Co. completed a 25,000,000-foot a day gasser on the Thomas Burns farm, Alma Township, Allegany County, at a total depth of 4,793 feet. Miller Ake got an 18,000,000-foot a day producer on the Walter Burrell farm, Genesee Township, Potter County, at a total depth of 5,127 feet, 8 feet in the sand.

Pennsylvania Operations

New York State Natural Gas Co. was drilling at 3,070 feet on the D. Rapan farm, Genesee Township, Potter County. Godfrey L. Cabot staked a location on the Theodore Cobb farm, same township and county. Sylvania Corp. was drilling at 914 feet on the George McCutcheon farm, Harrison Township, same county. New York State was drilling at 1,735 feet on the F. Whitney farm, Bingham Township, same county. Sylvania was idle at its location on the J. Steadman farm, Genesee Township, same county. William Snee and others were shut down at 6,272 feet on the Summit Hotel property, South Union Township, Fayette County. H. C. Drilling Co. was rigging up on the Lesser & Louner farm, Kinzua Township, Warren County. Cowanesque Gas Co. was drilling at 1,100 feet on the George Stebbins farm, Clymer Township, Tioga County. New York State was drilling at 110 feet on the Otto Burnside farm, same township and county. Godfrey L. Cabot was building a rig on the J. L. Lattimer farm, same township and county.

New York Operations

Belmont was casing at 4,939 feet on the J. O'Hara farm, Willing Township, Allegany County. Cunningham Natural Gas Co. was drilling at 3,840 feet on the same farm. Schrack and others had a bad hole at 2,460 feet on the Markey estate property. Utica Natural Gas Co. was shut down at 875 feet on the William Grimm farm, Western Township, Oneida County. Belmont was drilling at 1,975 feet on the J. A. Brown farm, Leon Township, Cattaraugus County. Farriman and others were drilling at 305 feet on the Cash Willis farm, Howard Township, Steuben County. Carpenter and others were drilling at 605 feet on the C. Matteon farm, Avoca Township, same county. Ross and others were shut down at 436 feet on the G. Wright farm, Portland Township, Chautauqua County.

OBITUARY

JOHN H. PATRICK, 55, who had followed oil play over the world, died in Okemah, Okla., during the week. He started when he was 17, taking part in the opening of Spindletop near Beaumont, Tex., and in Java, Sumatra, Mexico, West Indies and South America.

BURTON L. DELACK, general assistant to Vice President W. R. Burrows of the General Electric Co. and until two years ago manager of the company's Schenectady Works, died recently.

From the refiners
to the motorists

American motorists are getting a handsome present this spring and the Western Petroleum Refiners are giving it to them

It is a raise of 5 octane numbers in the minimum anti-knock value of their gasoline—and at the regular price The W P R A specifications, new and old, tell the story:

NEW octane rating, 68-70
Old octane rating, 63-70

That means the gasoline from many a so-called cracking unit cant get by any more as "regular grade"—it cant reach the new octane limit

That's a break for the Dubbs refiner

Dubbscracked gasoline always meets the specifications—and then some

Dubbscracking is the way to build up your gallonage—and your profits

Universal Oil Products Co
Chicago Illinois

Dubbs Cracking Process
Owner and Licensor

Oil News from Foreign Lands

Iraq Production Increases

Crude oil production of the Iraq Petroleum Co., Ltd., the first quarter of 1936 totaled 1,190,078 British tons, or 97,560 bbls. daily. This was an increase of 56 per cent over the production for the same quarter in 1935 which totaled 763,196 tons or 62,560 bbls. daily. Only part of this crude was shipped from the Haifa and Tripoli terminals located on the Mediterranean which connects the company's field by pipe line. The shipments from the two terminals the first quarter of this year were 888,053 tons or 72,800 bbls. daily. These shipments were in line with those of the last quarter of 1935. The shipments for the first quarter of 1935 when the Haifa line was operating part capacity averaged about 50,000 bbls. daily. The factor used in converting tons to barrels was 7.46.

IRAQ

The following table gives the production and shipments of the Iraq company by months for the first quarters of 1936 and 1935 (British tons):

PRODUCTION

	1936	1935
January	331,594	210,903
February	300,225	232,459
March	358,259	319,834
Total	1,190,078	763,196

SHIPMENTS—HAIFA TERMINAL

January	133,344	100,858
February	165,963	156,498
March	181,916	151,618
Total	381,223	308,974

SHIPMENTS—TRIPOLI TERMINAL

January	175,660	81,491
February	191,630	110,085
March	139,540	99,193
Total	506,830	290,769

Venezuelan Production

Crude oil production continued on a stable basis in Venezuela during April, 1936, when 12,823,217 bbls. were produced, a daily average of 427,443 bbls., compared with a production of 12,986,073 bbls., or 418,905 bbls. daily, in March, or an increase in the April daily average output of approximately 8,500 bbls.

It is apparent from the foregoing statistics that any political unsettlement which may have occurred in Venezuela, in connection with the April presidential election, did not affect the production of oil. This bears out reports reaching the oil companies here to the effect that conditions have been satisfactory.

VENEZUELA

One of the outstanding features of the Venezuelan production records is the continuing heavy production in the Lagunillas-La Rosa fields in the Maracaibo Lake basin. These fields produced a total of 9,007,696 bbls. of crude oil in April. The fields have yielded approximately 800,000,000 bbls. since discovery in 1925. Wells continue to show good staying qualities and it is said that the real limits of the field have not yet been defined. Drilling out into the lake from shore has now reached a depth in water of more than 40 feet.

Lago Petroleum Corp., which controls the lakebed concession, is the largest oil producing company, not only in the Maracaibo Lake fields but also in all of Venezuela. Its April production totaled 4,289,743 bbls., a daily average of 142,992 bbls. The Venezuelan Oil Concessions, Ltd., ranked second in production with 3,174,090 bbls., or 105,803 bbls. daily. Of this amount, 2,377,710 bbls., or 79,257 bbls. daily, came from the Lagunillas-La Rosa area.

Standard Oil Co. of Venezuela, the only company producing and shipping oil out of eastern Venezuela, with a total production in April of 2,429,308 bbls., or 80,978 bbls. daily, ranked third.

The Standard Oil Co. of New Jersey group of companies operating in Venezuela, namely, Lago Petroleum (Pan American Foreign) and Standard of Venezuela (Creole), produced a total of 6,719,051 bbls. of oil in April, a daily average of 223,970 bbls. The Royal Dutch-Shell subsidiaries, Venezuelan Oil Concessions, Caribbean Petroleum and Colon Development Co., produced a total of 4,718,220 bbls., or 157,274 bbls. daily.

The following table shows Venezuelan oil production by fields and companies in April, 1936, and April, 1935 (figures in barrels):

BY FIELDS

	April, 1936	April, 1935
Lagunillas	7,340,473	6,207,145
Ambrosio-La Rosa	1,667,223	1,600,448
Quiriquire	1,837,146	1,782,335
Mene Grande	1,117,710	910,000
Tarra	426,420	437,460
Cumarebo	244,345	314,448
Concepcion	102,290	116,790
El Mene	64,860	75,800
La Paz	21,750	15,530
	12,823,217	11,459,956

BY COMPANIES

	April, 1936	April, 1935
Lago Petroleum Co.	4,289,743	3,381,497
Venezuelan Oil Concessions, Ltd.	3,174,090	2,869,362
Standard of Venezuela	2,429,308	2,359,225
Venezuela Gulf Oil	1,260,000	1,438,000
Caribbean Petroleum Co.	1,117,710	910,000
Colon Development	426,420	437,460
British Controlled	64,860	75,800
North Venezuela Petroleum, Ltd.	61,086	78,612
	12,823,217	11,549,956

Wildcat drilling operations in the Lake Maracaibo basin came to a virtual standstill with the abandonment of No. 1 La Icotea at the entrance to Lake Maracaibo at a depth of approximately 7,600 feet.

Paraguay Considering Monopoly

The Paraguayan government is considering the passage of a law which would create a government monopoly of all oil operations in that country. Under the plan the state would have monopoly on all exploitation, drilling and transportation. Private owners would be paid for any damage to their property but would not share in the oil revenue. There is no commercial production in the country at this time but known structures are considered favorable.

PARAGUAY

Curacao-Aruba

Imports of crude oil into the Dutch West Indies islands of Curacao and Aruba for the year 1935 aggregated 121,402,000 bbls., a record, compared with 108,107,000 bbls. in 1934, according to statistics compiled by the Bureau of Mines. The daily averages were approximately 332,600 bbls. in 1935, against 296,100 bbls. in 1934. Practically all of the crude oil imported is refined in the plants of the Royal Dutch-Shell in Curacao and Aruba, and that of the Pan American Foreign Corp. (Standard Oil of New Jersey) at Aruba. Of the crude imported, all came from Venezuela except 707,000 bbls. from Colombia in 1935 and 634,000 bbls. from Colombia in 1934. In 1935, imports of gasoline, all from Venezuela, amounted to 1,180,000 bbls., while in 1934 only 184,000 bbls. of gasoline were imported. Imports of fuel oil in 1935 amounted to 4,847,000 bbls., compared with 4,836,000 bbls. in 1934. In 1935, oil exports from Curacao and Aruba included 6,409,000 bbls. of topped crude oil, 26,984,000 bbls. of gasoline, 3,793,000 bbls. of kerosene, 1,376,000 bbls. of lubricating oil 7,084,000 bbls. of gas oil, 68,170,000 bbls. of fuel oil and 5,750,000 bbls. of diesel oil. All figures for 1935 are in excess of those for 1934, with the exception of topped crude oil and gas oil.

D. W. I.

Exports from Curacao and Aruba by products, for 1935 and 1934, were as follows (figures in barrels):

	1935	1934
Topped crude oil	6,409,000	8,295,000
Gasoline	26,984,000	25,010,000
Kerosene	3,793,000	2,111,000
Lubricating oils	1,376,000	1,111,000
Gas oil	7,084,000	7,685,000
Fuel oil	68,170,000	58,444,000
Diesel oil	5,750,000	5,748,000
Total	119,566,000	108,404,000

In as much as all crude oil used in the Aruba and Curacao oil refineries must be imported, and practically all of the refined products manufactured are exported, the exports of various products are a close indication of the average refinery yields of products from the crude.

On this basis, the approximate yields for 1935 and 1934, in percentages, would be as follows:

	1935	1934
Gasoline	23.8	24.9
Kerosene	3.3	2.1
Lubricating oils	1.2	1.1
Gas oil	6.2	7.6
Fuel oil	60.3	58.3
Diesel oil	5.2	6.0

The importance of the Dutch West Indies islands in the international oil trade is indicated by the fact that oil was exported in 1935 to every continent in the world, including, for instance, fuel oil to Egypt, British South Africa, Argentina, United States, Italy, Palestine, Algeria, and even to Antarctica; and gasoline to the Irish Free State, French West Africa, Norway, etc., and diesel oil to Manchukuo, China, Port Said, Panama.

The biggest volume of gasoline exports in 1935 to any single country was to the United Kingdom, which imported in 1935 18,611,000 bbls., or approximately 69 per cent of the Dutch West Indies total exports of gasoline. The largest shipments of fuel oil were to the United States, which took 17,771,000 bbls., or about 27 per cent of the total exports.

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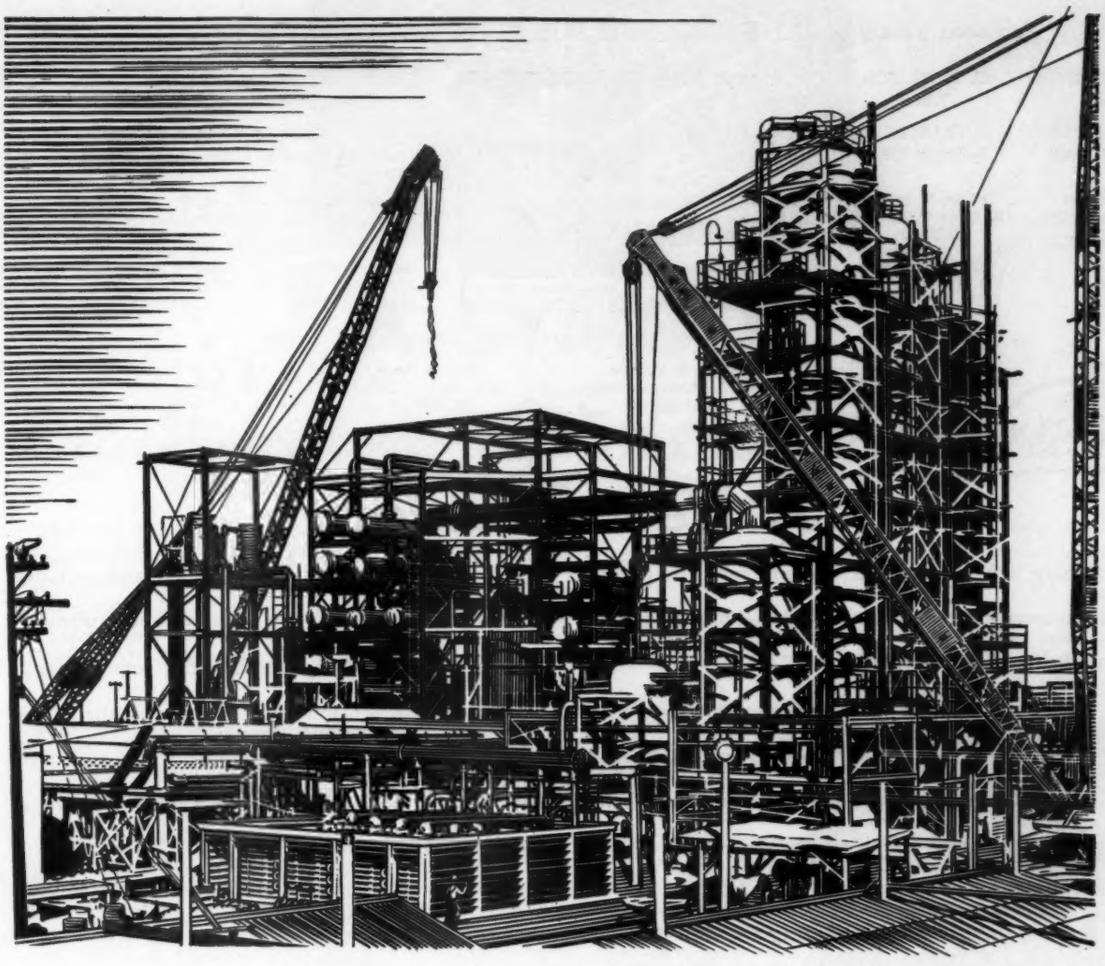
Iraq Petroleum Company terminal at Haifa, Palestine



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A New Standard

There are exceptional reasons why the ninth annual International Petroleum Exposition promises to be most successful on record.

The undoubted progress towards recovery visible in oil company earnings, the more than anticipated gains in the demand for petroleum products, and the consequent impulse to seek new reserves have intensified interest in operating methods.

More than that, oil men during the dull days of depression had time to think out many problems, to study details, to work out solutions and plan new or improved methods in operation and management. Especially was this true of the engineers and technical men associated with oil companies and the manufacturers of oil industry equipment.

The result has been that in no similar period has so much progress been accomplished as will be seen when the exhibits displayed at the Exposition are thrown open for inspection.

Oil men who have had opportunity to witness the assembling of these exhibits have expressed their conviction that this year's Exposition will so far exceed all others that it will establish a new standard for this, the world's greatest single industry exhibition. No other industry has anything like it, in value of exhibits or cost of transporting, assembling and displaying them.

Exposition officials are stressing the educational value of the enlarged scientific and technical exhibits to operators in the industry and students.

Primarily designed to bring together suppliers and users of oil industry equipment the Petroleum Exposition has long been a contact place for representatives of other basic industries that value the oil industry as a very important customer. Moreover, oil has become such an indispensable and universal factor in industry and business that first hand knowledge is an asset in business.

The buying power of the industry is enormous, not only in the immediate sphere of oil industry supplies, but spreading throughout the land as it transmutes natural wealth into national currency in general circulation.

It was the first industry to brace itself for recovery, proclaiming anew its faith in individual initiative and independence, and the results have justified that courage and confidence. The Ninth International Petroleum Exposition will open in Tulsa Saturday with the oil industry in the best condition it has been for six years, its expanding markets mirroring the return of national prosperity and assuring continuance of profitable operation while good judgment prevails.

Tulsa, the oil capitol of the world, and The Oil and Gas Journal welcome you and hope you will be pleased and profited by your visit.

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MORE IMPORTANT than design or construction in establishing the worth of Jenkins Valves are three hidden extra factors: the *Materials* that go into them; the *Men* who make them; the *Integrity* of the maker back of them. These things no specification or order can assure; no instrument can measure. Yet, in them lies the difference between Jenkins Valves and others. They put into a "Jenkins" the extra-measure of quality that makes it consistently last longer and work better.

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Materials

There is no mystery back of the famed ability of a "Jenkins" to handle ordinary duty with an ease that means longer life and less maintenance, or to "carry-on" even when extraordinary strains are encountered. Valve stamina is in direct ratio to the quality of the materials put into it. And a "Jenkins" is made of the finest. Only virgin metals that stand critical analyses and tests can get into Jenkins castings. Even the foundry sand has to be of exceptional quality, proved in special testing apparatus like the Crusher shown below.

Men

A Jenkins Valve could not be the dependable product it is except for the men who stand at the benches and machines in the Jenkins plant. No ordinary workers are these, but *Craftsmen*. They have the skill that comes only with years. In the Jenkins plant, a workman is a "youngster" until he has followed his art for a score of years. But, more important than experience, is their pride in making valves as fine as they can. It might be called "old-fashioned" but it gets the superlative quality thousands of valve users demand.

Integrity

Seventy years ago, the now famous Jenkins policy of building to a plus standard of value was instituted. This policy has built the universal faith of engineers in any "Diamond" marked valve, and to keep this faith is Jenkins' determination. From ingot to the packing table, quality is continuously checked by an elaborate system of inspection and testing that guarantees the capability of every Jenkins Valve when it reaches the buyer. Shown above is the Shell-and-Seat test which every valve must pass.

Back-Side Crank Pumping and Catenary Rod Lines

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A.P.I.—Presented Mid-Year meeting of American Petroleum Institute, Tulsa, May 14, 1936.

Much time would be required to discuss the different items of back-side pumping equipment, such as various types of wrist-pin bearings, stroke posts, knock-offs, swings, jacks, etc. It is assumed we are all familiar with the functions of these standard items; so only a few general remarks will be devoted to their installation. The seven

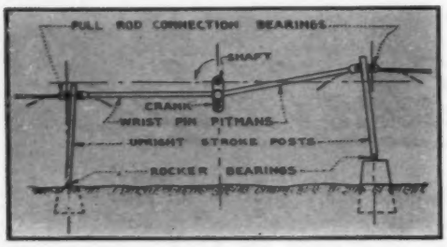


Fig. 1—Stroke-post connection to back crank

following items cover minor points in the design and construction of a rod-line system. These details add nothing to the cost, and yet effect substantial economy and smoothness of operation.

1. Upright stroke posts should be set so that wrist-pin pitman is approximately level at the middle of upstroke of well. This will slightly reduce torque on the unit shaft, and lighten load on the bearings (see Figure 1).

2. The pull-rod connection bearing on upright stroke posts should be vertically over rocker bearing at mid stroke. This will reduce the vertical movement of knock-off pitman to a minimum, thereby minimizing wear of slide bar on knock-off post. (see Figure 1).

3. The slide bar through knock-off post should be so spaced that the well can be hooked off and on near top of stroke. This will reduce shock on the entire system, and will also tend to eliminate pull-rod and sucker-rod breaks caused by plunger being sand-stuck in working barrel.

4. Swings and hold-overs should be set as far from knock-off as practicable to lessen the shock on them when well is hooked on and off.

5. Swing post should be set at the intersection of the two planes which are perpendicular to the two lines of pull, to eliminate eccentric loads on swing bearings. In other words, the post should be set plumb only when the rod lines in both directions from swing are truly horizontal (see Figure 2).

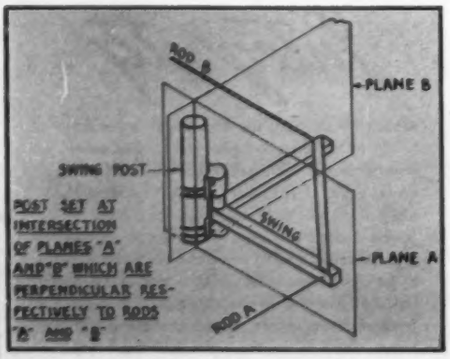

ROD B
PLANE B
SWING POST
POST SET AT INTERSECTION OF PLANES "A" AND "B" WHICH ARE PERPENDICULAR RESPECTIVELY TO RODS "A" AND "B"
SWING
PLANE A
ROD A

Fig. 2—Swing-post setting

(The statements and opinions expressed herein are those of the author, and should not be construed as an official action or opinion of the Institute.)

6. Swing post should be set a sufficient distance from rod-line intersection so that when swing is mounted the end-bearing connection will be from 1 inch to 2 inches (depending on length of stroke) out of line on the side away from swing post when swing arm is perpendicular to rod line (see Figure 3). This will minimize the angle of bend of rods at the rub post during the pumping cycle.

7. Hold-over post should be set in such position that hold-over arm will bisect the interior angle of rod line at mid-stroke, and that end bearing will be 2 inches to 3 inches (for 20-degree

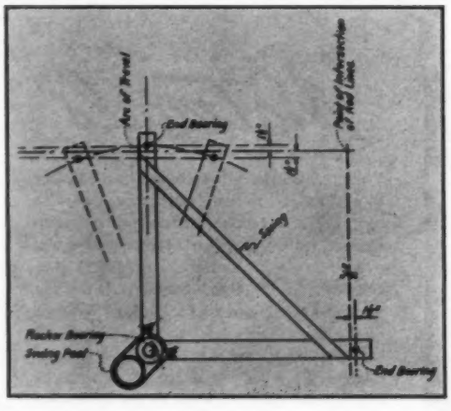


Fig. 3

rod-line angle) outside the point of intersection. This will reduce rod bend at the rub post.

Crank Positions

Crank positions are important to the proper balancing of rod-line wells. The correct crank position for one or two wells pumping on the back side of a beam well is well known. Consideration will, therefore, be given to the case of a pumping unit set away from any well and used to pump jack wells only. Figure 4 is a sketch of the hook-up. Wells No. 1 and 2 are on the back crank C, and wells No. 3 and 4 on the front crank B, rotation being in a counter-clockwise direction. Figure 5 illustrates a dynamometer card of a representative jack well in the Pampa area, which will be assumed as typical of the four wells considered.

To simplify analysis of the forces acting, consider the net torque on the unit shaft which must be overcome by the prime mover.

A one-well hook-up will be considered first. The torque produced by this well is shown by curve A of Figure 6. Curve B is the torque produced by a 6,500-pound effective counterweight on the other crank, lagging crank C by 90 degrees. It is the simple sine curve. The total net torque on shaft with the well counterbalanced in this manner is shown by curve C. This gives two approximately equal peaks of 3,200 foot-pounds at about 105 degrees and 240 degrees of crank travel. The equal peaks show that the well is properly counterbalanced, and check the average load shown on dynamometer card. If a 7,500-pound counterweight were used, its torque (curve D) combined with well No. 1 would be curve E.

This gives a peak of 2,300 foot-pounds at 105 degrees, and 4,200 foot-pounds at 240 degrees; and shows the counterweight to be too heavy. Should

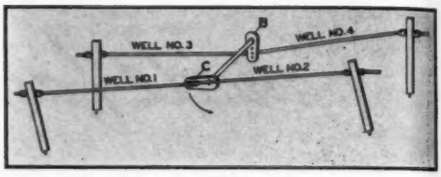


Fig. 4—Rod-line hook-up to standard rig

the higher peak be in the first half of the stroke, it is evident that the weight is too light.

Forces due to momentum of counterweight have not been considered in this and the following curves because, although they would change the shape and magnitude of counterweight-torque curves, they would not change the conclusions drawn, and would involve more complicated figures. For very slow speeds, the difference between these counterweight-torque curves and those considering dynamic forces is negligible. However, for higher speeds, the difference is considerable, as shown in Figure 7.

Figure 8 shows the effect of the counterbalance crank lagging crank C an additional 15 degrees. Curve B is again the torque of counterweight at 90-degree lag, while curve C is torque if counterweight is at 105-degree lag—apparently the correct point, because the peak of well No. 1 is at 105 degrees. Curve D is the combined torque of the well and counterweight at 90 degrees; while D_1 is a similar curve, except with counterweight at 105 degrees. Although the peaks are lowered slightly in D_1, the negative torque is increased, and stress reversals are practically the same for both conditions. Probably the best position for counterweight for this well would be at 97½-degree lag. This gives the curve E with all torque positive.

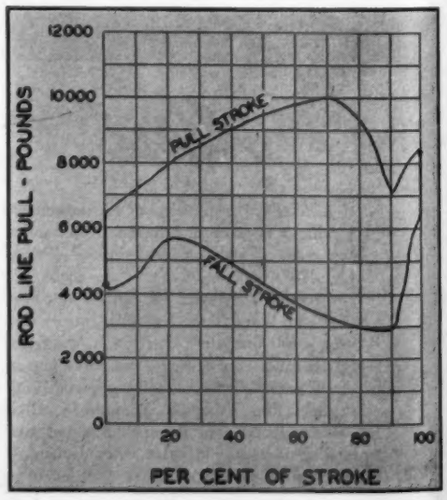


Fig. 5—Dynamometer chart of Jackson No. 7

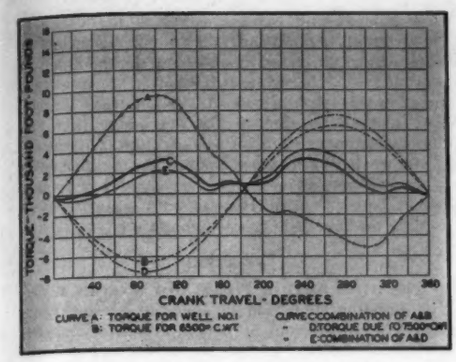

TORQUE-THOUSAND FOOT-POUNDS
CRANK TRAVEL-DEGREES
CURVE A: TORQUE FOR WELL NO.1
" B: TORQUE FOR 6500# C.W.T.
" C: COMBINATION OF A&B
" D: TORQUE DUE TO 7500# C.W.T.
" E: COMBINATION OF A&D

Fig. 6—Shaft torque—one well

It should be noted that the maximum weight on a beam well is usually early in the stroke, while for a rod-line well it is usually past mid-stroke; also that the maximum torque is not necessarily at the maximum weight. For the well considered here, the peak weight is at 70 per cent of the up-stroke, or about 115 degrees of crank travel; whereas the maximum torque is at 105 degrees of crank travel. There are also factors in the mechanical hook-up that would change the relative positions of maximum weight and maximum torque. In view of these facts and the slight difference between curves D, D_1, and E of Figure 8, it is believed that leading or lagging a few degrees is not practical. This is substantiated by the fact that if momentum forces are considered, the low point on counterweight-torque curve would be later in the stroke than 90 degrees. For instance, for counterweight shown in Figure 7, with speed of 20 strokes per minute, this low point would be at about 110 degrees of crank travel.

These curves clearly depict the fact that these two wells can be pumped with an engine of lower

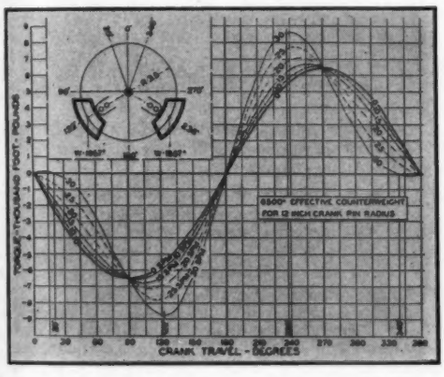


Fig. 7—Speed effect on counterweight torque

horsepower capacity than would be necessary to pump one well not counterbalanced, since instantaneous horsepower is directly proportional to the ordinates of these torque curves.

A two-well hook-up will now be considered. Curve A of Figure 9 is again well No. 1 torque, and B is torque of No. 2 pumping from the same crank. Curve C is the combined torques of wells No. 1 and 2. Note that the peak loads are much less than for each well separately, and the minimum load hardly reaches the zero line.

Curve A of Figure 10 represents the torque produced by the combined loads of wells No. 1, 2, and 3, with cranks 180 degrees apart. The load is very light, and drops below zero during the first half of the stroke, but reaches a high peak when No. 3 is on its up-stroke. Curve B shows the same wells, but with No. 3 crank leading No. 1 and 2 crank by 90 degrees. This gives a peak load at the beginning and end of stroke, and is negative about mid-stroke. If a 6,500-pound counterweight is put on crank C, and its torque combined with curve B, curve C is obtained; this represents wells No. 1 and 2 plus counterweight on crank C and No. 3 on crank B leading crank C 90 degrees. If well No. 3 were a beam well, the correct setting, of course, would be cranks 180 degrees apart with counterweight on crank with No. 3.

Curve A of Figure 11 shows the torque produced by four wells with cranks 180 degrees apart. The torque varies from almost zero to a high peak and back again every 180 degrees of crank travel. If cranks are 90 degrees apart, a very uniform load is obtained as shown by curve B.

Summary

The following conclusions are drawn from these torque curves:

1. One well should be counterbalanced on the opposite crank leading or lagging by 90 degrees, depending on direction of well.
2. Two wells on same crank require no counterweight.
3. In a three-well hook-up counterweight should be on the two-well crank and 90 degrees from the one-well crank.
4. In a four-well hook-up cranks should be 90 degrees apart, and no counterweight is necessary.
5. In any hook-up if the net torque can be held

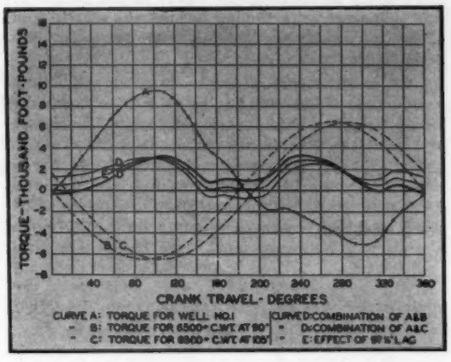

TORQUE-THOUSAND FOOT-POUNDS
CRANK TRAVEL-DEGREES
CURVE A: TORQUE FOR WELL NO.1
" B: TORQUE FOR 6500# C.W.T. AT 90°
" C: TORQUE FOR 6500# C.W.T. AT 105°
CURVE D: COMBINATION OF A&B
" D1: COMBINATION OF A&C
" E: EFFECT OF 90 1/2° LAG

Fig. 8—Effect of counterweight lag

above the zero line, no power is lost, and there is no stress reversal to cause back lashing of gears or to cause jumping of belt.

6. If depressions can be raised and peaks lowered in the torque curves by counterweighting, a smoother running unit will result with no increase in work done.

The conventional method of laying pull rod lines is on a uniform grade from power to jack well, line being supported at 25-foot intervals on doweled oak carriers, commonly known as "doll heads," set in 2-inch pipe stakes. In such an installation each doll head supports the weight of one 25-foot rod and coupling, or about 40 pounds for three-fourths inch rods. Since it is a difficult matter to keep doll heads properly greased at all times, the friction between rod and doll head is an important item. Dynamometer tests show that a conservative average coefficient of this friction is about 0.3; or a pull of 300 pounds is required per 1,000 pounds of rods to overcome friction. The coefficient is only about 0.1 to 0.2 when doll heads are freshly greased, but it reaches 0.5 to 0.6 after grease has practically worn off.

There are two methods in use to reduce this friction:

1. Roller rod-line carriers to replace oak doll heads.
2. Series of sags in rod line.

The first method is more expensive, but should be more efficient—provided the rollers have well lubricated dust-proof bearings. We have not made

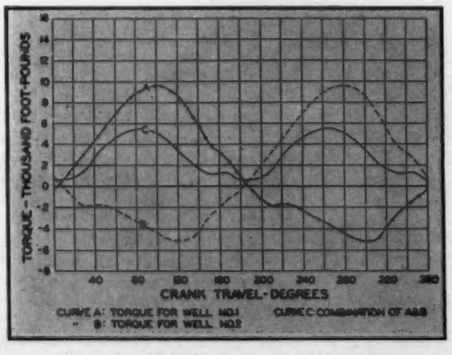

TORQUE-THOUSAND FOOT-POUNDS
CRANK TRAVEL-DEGREES
CURVE A: TORQUE FOR WELL NO.1
" B: TORQUE FOR WELL NO.2
CURVE C: COMBINATION OF A&B

Fig. 9—Shaft torque—two wells

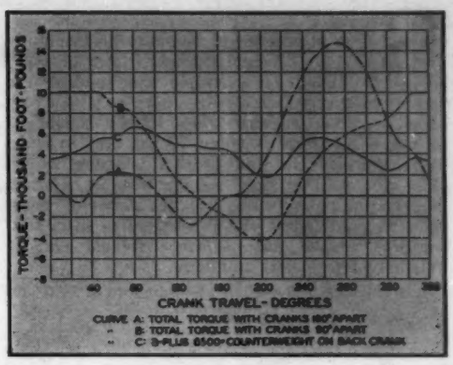

TORQUE-THOUSAND FOOT-POUNDS
CRANK TRAVEL-DEGREES
CURVE A: TOTAL TORQUE WITH CRANKS 180° APART
" B: TOTAL TORQUE WITH CRANKS 90° APART
" C: B-PLUS 6500# COUNTERWEIGHT ON BACK CRANK

Fig. 10—Shaft torque—three wells

sufficient tests and study of these roller carriers, and have no definite data on savings effected by them. They cost about $100 per 1,000 feet of rods.

Our company in the North Texas area has used the sag system quite extensively (see Figure 12); since the sags effect a substantial saving in power, and are inexpensive. They cost from nothing to $10 or $15 per 1,000 feet of rods more than the conventional uniform grade method, and in many cases cost less by eliminating hold-downs in low places.

It is necessary to know the proper relation between the different factors involved in order to get the maximum benefit and at the same time prevent the rods from jumping out of the bottom of sags. Figure 13 shows a catenary supported at the points A and B of equal elavation. If P is the pounds pull on rod line, w is pounds per foot weight of rods, 2x is distance between supports A and B, and y is the amount of sag, then $wx^3 = 2Py$. (This parabolic formula so closely approximates the true catenary, that the error is negligible when the sag is less than 10 per cent of the span.) Level supports represent a condition

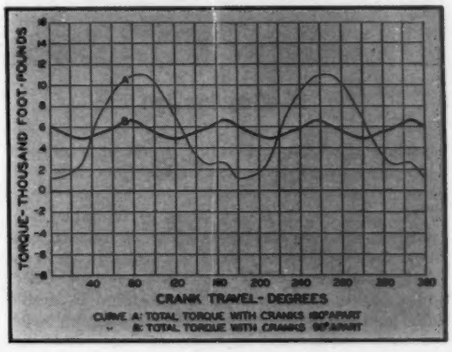

TORQUE-THOUSAND FOOT-POUNDS
CRANK TRAVEL-DEGREES
CURVE A: TOTAL TORQUE WITH CRANKS 180° APART
" B: TOTAL TORQUE WITH CRANKS 90° APART

Fig. 11—Shaft torque—four wells

seldom encountered in actual practice, but hereinafter are several formulas of practical value derived from the above basic formula.

This system of sagging rod lines is especially adaptable in areas of rolling terrain, as many hold-downs and high rod-line stakes might be eliminated if maximum allowable sag is known.

To clarify the relation between the above formula and friction reduction, a specific case of a well pumping with 2,000 feet of three-fourths inch pull rods (1.6 pound per foot) laid in the conventional manner will be considered. The dynamometer chart on this well shows a maximum of 7,600 pounds average up-stroke weight of 6,090 pounds, and average down-stroke weight of 2,117 pounds, or a mean effective weight of 3,973 pounds. Horsepower is 2.6 at 14.4 18-inch strokes per minute. If coefficient of friction is 0.3, the loss due to friction is $0.3 \times 2{,}000 \times 1.6 = 960$ pounds on each half of the stroke.

If sags are installed in this line supported on holdups 5 feet high, from the basic formula

$$x^2 = \frac{2Py}{w} = \frac{2 \times 8{,}500 \times 5}{1.6}, \text{ from which } x = 230$$

feet or 2 × (distance between hold-ups) = 460 feet. Although the maximum weight of the well is only

7,000 pounds, P is assumed as 8,500 pounds, because it is good practice to increase the maximum load 10 to 15 per cent to provide for additional weight that might be caused by tight plunger fit, greater jack ratio, etc. Where there may be a paraffin condition, the maximum weight should be increased as much as 60 to 70 per cent in some cases to provide for additional weight due to paraffin accumulation in tubing. For instance, a 3,200-foot well at Pampa using 2½-inch pumping equipment weighed 14,500 pounds maximum. After tubing was pulled and paraffin steamed out, it weighed 9,200 pounds maximum.

On the up-stroke when average weight is 6,000,

$$w = \frac{2Py}{x^2} = \frac{2 \times 6{,}000 \times 5}{230^2} = 1.15 \text{ pounds per foot}$$

of rods relieved from doll heads, which represents a saving of $1.15 \times 2{,}000 \times 0.3 = 690$ pounds average. On the down-stroke $w = \frac{2 \times 2{,}117 \times 5}{230^2} = 0.4$ pound per foot not carried by doll heads, a saving in friction of $0.4 \times 2{,}000 \times 0.3 = 240$ pounds; or a total saving of 930 pounds in a complete revolution. This represents a reduction in horsepower of 0.61, or 23 per cent.

Fig. 12—Sagging rod line

We have two adjacent leases in Wichita County, each of which was pumped from its own central handwheel power, rod lines being in the conventional manner. These powers were dismantled, and a new one built in a central location to handle both leases (twenty-three 1,800-foot wells) with rod lines constructed in series of sags. Hold-ups were not spaced as closely together as possible for maximum benefit because of topography and existing roads. Dynamometer charts were made of all wells before and after the new installation. Although 32 per cent more rods were used, an average reduction of 19½ per cent in horsepower was effected. Part of this was due to the bad condition of the original rod lines. Similar reductions have been measured in other installations.

Hold-ups

Figure 14 illustrates a type of hold-up now being used on more than 100 of our wells. Several are being used on 3,200-foot wells, and some have been in use for as long as four years. A few failures have occurred due to faulty welding of the box, but none due to wear. This hold-up consists of a shop-made welded angle-iron box, attached to a 2-inch pipe stake by means of a sleeve clamp, and a pipe nipple roller to carry the pull rod. The box should be strongly welded to prevent damage by rod-line vibration. The cost is about $10 complete, including pipe stake with welded braces, concrete, and labor for setting. The only attention required is the application of a little grease occasionally at the point where the rod contacts the roller to permit slippage when the roller bumps the end of the box. Otherwise, the roller might be forced over the end of the box and dropped to the ground. Grease is not desirable in the box.

It was at first feared that bending of rod over

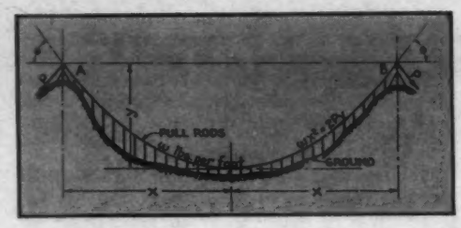


Fig. 13—Exaggerated profile of pull rod line

roller hold-ups would quickly fatigue and break them, but such has not been the case. Our only explanation is this: The rod does not make a sharp bend over the roller, but a gradual arc. To form this permanent arc, the rod must pass its yield point; and the stress set up in excess of the yield point in a ductile material establishes a new yield point approximately equal to the stress set up.* This prevents flexing beyond the elastic limit after the permanent arc has been formed; hence fatigue does not result.

Too great a vertical angle over the roller must not be used if the above is to hold true. Our experience indicates that for a 3,200-foot well weighing about 10,000 pounds maximum, a vertical angle greater than 5 degrees to 6 degrees should not be used. For wells 2,000 feet deep and less, weighing 4,000 pounds to 7,000 pounds, angles up to 7 degrees or 8 degrees may be safely used. The angle of rods with the horizontal (θ in Figure 13) is an angle whose tangent is $\frac{2y}{x}$. If the sag to the left of point A is the same as that to the right, the angle of bend of rods is 2θ.

Design and Installation

Although each rod line presents a different problem because of topography and other factors, computations are simple—and an engineer with one helper can plan several in one day. Although a profile of the ground is not essential, it is helpful, and is recommended until one becomes familiar with the method.

In construction, hold-ups should be set first and a wire stretched between them with sufficient tension so that it will sag to the predetermined elevation between hold-ups, as a guide for driving rod-line stakes. Allowance of about 3 inches should be made for doll heads.

Conclusion

Life of the equipment in back-side hook-ups and rod lines will depend to a great extent on accuracy of alignment and careful attention to details in the original installation; on proper balancing of loads on the unit; reduction of friction as much as possible; and occasional inspection to see that alignment is maintained. It will depend largely, also, upon adherence to the old adage that "no chain is stronger than its weakest link." Breakage of the weak link may seriously damage other parts of the rod line system; so a very careful inspection should be made of all second-class material to be used to see that it is in good condition.

*James E. Boyd, Strength of Materials, 2nd edn., McGraw-Hills Book Co., p. 39.

Fig. 14—Roller hold-up

Formulas

The curve ACB in Figure 15 represents a sagging rod line supported by hold-ups at the points A and B of different elevation. To determine the horizontal position of the bottom of sag and the amount of maximum sag:

$$x = \frac{L^2 - \frac{2Pm}{w}}{2L}$$

Then from the basic formula:

$$y = \frac{wx^2}{2P}, \text{ and } y + m = \frac{wz^2}{2P}$$

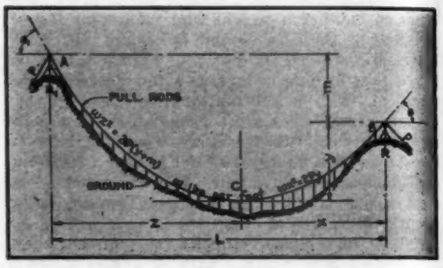


Fig. 15—Exaggerated profile of pull rod line

where:

L = distance between hold-ups, in feet.
m = difference in elevation of hold-ups, in feet.
w = weight in pounds per foot of pull rods.
P = maximum weight of well on pull rods, in pounds.
x = horizontal distance from bottom of sag to B.
z = horizontal distance from bottom of sag to A.
y = amount of sag below B.
y+m = amount of sag below A.

The more usual case is where ground between hold-ups is of such elevation that maximum sag cannot be allowed. Then the value of y will be fixed, and the value of w will be unknown. This value of w will be something less than the actual weight of rods used, and will represent that part of their weight lifted from doll heads at the maximum weight of well. In this case:

$$x = \frac{L}{m}\left[\sqrt{y(y+m)} - y\right], \text{ and}$$

from the basic formula

$$w = \frac{2Py}{x^2} = \frac{2P(y+m)}{z^2}.$$

To find the angles θ and θ_1 of rod with horizontal at hold-up:

$$\text{Tan } \theta = \frac{2y}{x}, \text{ and Tan } \theta_1 = \frac{2(y+m)}{z}$$

To find load to be carried by hold-up, or reaction:

$$R = P \sin \theta, \text{ and } R_1 = P \sin \theta_1$$

These reactions are equal to the total weight of rods lifted between bottom of sag and supports, or $R = wx$ and $R_1 = wz$.

The sag on both sides of a hold-up must be considered when it is desired to find the total angle of bend of rod or the total reaction on hold-up.

Means of Maintaining the Efficiency of Large Gas Transmission Lines

By R. M. LAULKERE
Engineering Supervisor, Southern California Gas Co., Los Angeles

The problem of maintaining the efficiency of gas transmission pipe lines has, within the past few years, become recognized as one of major importance to the natural gas industry. Prior to the present era of long distance transmission systems which require tremendous expenditures for construction and operation, the value of flowing efficiency was not generally appreciated.

In the text of this paper the most important factors affecting pipe line efficiency will be reviewed, and an endeavor made to give a method of solution to those interested in the problem.

Factors Tending to Reduce Pipe Line Efficiency

It is recognized that flow formulae are based on relations which hold for a straight, level pipe line, free from bends or other obstructions to flow. Since all lines have bends, valves, fittings, etc., the volume delivered is always somewhat less than the calculated volume. It is readily apparent that the effect of these obstructions cannot be eliminated, but the engineer can make allowances for them in the design. Hence, for the purpose of this paper, this factor will not be considered in the maintenance of pipe line efficiency.

Among the other factors which tend to reduce the efficiency of a transmission system is the accumulation of foreign matter at various points in the pipe line. These materials consist chiefly of:

(1) Dust, dirt and other solid foreign matter.
(2) Water and other liquids.
(3) Natural gas hydrates.

During the construction of a pipe line there will invariably be an accumulation of dust, dirt, welding slag and other material in the line. This debris is usually distributed quite evenly throughout the length of the line, and if it is not removed by blowing the line before it is placed in operation, it is likely to be carried along in the stream of flowing gas and accumulate in low places, fittings, valves and other similar points. The effect of this accumulation is a partial blocking of the gas passage and a resulting excessive pressure drop at these points.

Another source of dust and dirt is from polluted gas, especially if the gas is received directly from the wells and the gathering lines are not adequately protected. If the gas is received from absorption plants it is usually comparatively free from dust and dirt, but may contain corrosive elements as well as water and oil.

Water and oil accumulations are very common in natural gas transmission lines. These may enter the system in the liquid form or may be contained in the gas as vapors. In the latter case, it is entirely possible that, as the pressure and temperature relationships change, the condensation of the vapors may result. In any event, the net result is that the liquids tend to collect in sags and low places where they act as obstructions to the free passage of the gas stream. In some localities where the ground temperature is below the freezing point of water, the effect can be aggravated by the actual freezing of the accumulated liquid.

In addition to deposits of dust, dirt and liquid, it has been found recently that in certain sections of the country, pipe lines may become clogged with compounds known as natural gas hydrates. These hydrates have definite chemical compositions, that is, the ratio of the amount of water to the amount of gas fraction present is always constant. In a methane hydrate there are always seven molecules of water to one molecule of methane. The same ratio holds for ethane, but for carbon dioxide the ratio is only six molecules of water to one of carbon dioxide gas.

Natural Gas Hydrates

E. G. Hammerschmidt of the Texoma Natural Gas Co., in an article published in Volume 26 of Industrial and Engineering Chemistry, describes a series of interesting experiments on natural gas hydrates. The article contains a graph showing the relationship between the pressure and melting point of the natural gas hydrates tested. It must be remembered that this curve is merely typical and that each natural gas would have its individual curve, depending upon its composition. For average California gas, it has been found that at a gauge pressure of 400 pounds per square inch the natural gas hydrates form at about 52° F. This is in fair accord with the curve developed by Mr. Hammerschmidt.

A.G.A.—Presented before annual convention Natural Gas Department American Gas Association, Dallas, Tex., May 5 to 8.

The effect of the formation of natural gas hydrates in a pipe line is to materially reduce the effective inside diameter of the gas passage, resulting in excessive pressure losses as in the case of dust or liquid accumulations.

The most serious factor tending to reduce pipe line efficiency is the effect of internal corrosion. Like pipe line efficiency, this subject has only recently come into recogniton as an important consideration in natural gas pipe line operation and maintenance. By internal corrosion is meant the deterioration of the interior pipe wall due to chemical action between the steel and the fluids within the pipe.

Studies of internal corrosion have shown that even very small percentages of hydrogen sulphide, oxygen and carbon dioxide in the gas cause very rapid internal corrosion in the presence of free water. Practically all gas produced in California has been found to contain one or more of these impurities, and up to the present time no economical or practical method of removing them has been developed. Since the reaction occurs only in the presence of water, it appears that the corrosive action on the internal surface of the pipe can be eliminated by preventing the condensation of water vapor in the line.

California Experiments

A series of experiments is now under way in the laboratory of the Southern California Gas Co. to determine the rate of internal corrosion caused by gases containing various percentages of hydrogen sulphide, oxygen and carbon dioxide. In this study the corrosion is caused by the exposure of steel test specimens to gas atmosphere containing controlled concentrations of hydrogen sulphide, oxygen, carbon dioxide and water. These tests are being conducted at a pressure of several inches of water and a temperature of 70° F. As yet no tests have been run with carbon dioxide but it is planned to do this in the near future.

While this study is not complete, sufficient tests have been made which show a definite trend as indicated by the following table.

Test No.	Per cent saturation	Per cent oxygen	Sulphur grains/ 100 cu. ft.	Loss in ounces /sq. ft./ year
1	132.0	0.00	00.00	0.304
2	75.3 to 132	5.86	100.0	0.644
3	132.0	5.86	100.00	9.32
4	75.3	5.86	100.00	0.209
5	75.3	5.86	100.00	0.162
6	132.0	0.00	100.00	0.675
7	132.0	5.86	00.00	3.14
8	132.0	21.00	00.00	6.25
9	75.3	21.00	00.00	0.00

Tests 8 and 9 were with air—all others were with natural gas.

Bearing in mind that tests such as these are subject to certain experimental error, many of which are additive, and are of such a nature that they tend to exaggerate the computed loss due to corrosion, these data form the basis of the following conclusions.

1. In the absence of hydrogen sulphide and oxygen, natural gas which is oversaturated is not corrosive to steel at normal temperatures. (Test No. 1.)

2. Natural gas considerably undersaturated, and containing both hydrogen sulphide and oxygen, is not corrosive to steel, while the same gas carrying free water is very corrosive. (Tests Nos. 3, 4 and 5.)

3. Natural gas containing hydrogen sulphide, but no oxygen, if oversaturated is very much less corrosive than if the gas also contained oxygen. (Test Nos. 3 and 6.)

4. Natural gas containing oxygen, but no hydrogen sulphide, if oversaturated is corrosive. (Test No. 7.)

5. If natural gas containing hydrogen sulphide and oxygen is alternately over and undersaturated, it is relatively corrosive to steel in proportion to the time of oversaturation. (Tests Nos. 2 and 3.)

6. Air containing free water is very corrosive to steel, but it is not corrosive if considerably below saturation.

Under Item No. 5 the gas in Test No. 2 was maintained in an undersaturated condition approximately 90 per cent of the time, and in an oversaturated condition about 10 per cent of the time. Under these conditions the loss of metal in ounces per square foot per year was 0.644. In Test No. 3 the gas was oversaturated 100 per cent of the time and showed a loss of 9.32 ounces of metal per square foot per year. The ratio of loss for these two tests was 14.4, whereas the relation of approximate oversaturation time was 10. However, as the time of oversaturation was only an approximate 10 per cent, this indicates a reasonable agreement under the conditions.

It has been our experience that under certain conditions, the products of internal corrosion of the pipe metal accumulate on the pipe walls. This reduces the effective inside diameter of the pipe and increases the wall friction. As these products dry out and drop off, they are carried along in the gas stream accumulating in the same locations as dust and dirt from other sources.

Original Performance

The first step in maintaining the original efficiency of a long transmission line is to make a complete and thorough performance test of the line as soon as it is placed in operation. The purpose of such a test is to establish a basis upon which performances checked at subsequent dates

can be compared. The importance of obtaining a complete record cannot be overemphasized.

The data should include records of the volume, pressure, temperature and specific gravity of the gas at both ends of the line and at as many intermediate points as possible. It is important that all instruments used in obtaining these data be checked for accuracy. Gauges of the dead weight type are recommended for obtaining pressure data, but if they are not available the pressure gauges used should be checked before and after the required data are recorded. In addition to the above data, ground tmperatures at pipe depth should be recorded. If the temperatures are such that condensation of water vapor is likely to occur, provision should be made to keep the line clear of liquid by the installation of suitable drips and bleeders. The actual delivery volumes under the respective pressure and temperature conditions existing at the times the test data are recorded, may be considered as the volumes to be expectd under 100 per cent efficient operation, assuming, of course, that the line was properly blown before being placed in operation and that no liquids were permitted to accumulate during the test period.

Maintaining Original Efficiency

As mentioned before under "Factors Tending to Reduce Pipe Line Efficiency," deposits of foreign matter are a severe detriment to efficiency and much thought should be given to their elimination.

Where gas is purchased on contract, the stipulation should be made that it is to be reasonably free from dirt, dust, water, hydrogen sulphide, oxygen, carbon dioxide or other injurious impurities. Should the gas available be polluted with dust or liquid, suitable scrubbers should be installed on all gathering lines to adequately protect the transmission system. There are many scrubbers on the market for the removal of dust and liquids from gas streams, but care must be exercised to insure the proper selection as to capacity and efficiency of extraction.

Among the requirements for satisfactory performance are the following desirable characteristics:

1. The design should be such that it does not create an excessive pressure drop.
2. The design should be one that embodies a change of direction of flow, or the principle of impact for the removal of small water particles.
3. The scrubber should be so constructed that it is impossible for the impurities to by-pass the element effecting extraction.
4. The area at the point of change of flow direction should be such that the velocity of the gas stream is less than that required to carry minute particles of water in suspension.

The following equation may be found useful in checking available liquid separators to ascertain whether or not the design is in accord with the requirements mentioned. The velocity at which a stream of flowing gas will hold minute particles of water in suspension is not definitely known. However, pioneers in the absorption process of gasoline extraction found that if the contacting towers were designed so that the lineal velocity of the gas did not exceed 600 feet per minute, at 30 pounds per square inch gauge pressure, no oil would be carried from the tower in the gas stream. Based on this experience, the maximum allowable lineal gas velocity at any other gauge pressure can be solved by the following equation.

$$V = 600 \sqrt{\frac{30+Po}{P+Po}} \text{ in which}$$

V = Maximum permissable lineal gas velocity in feet per minute at gauge pressure P.
Po = Atmospheric pressure, pounds per square inch.
P = Gauge pressure pounds per square inch.

Since the formula is valid for use with a light oil, it appears that velocities obtained by it would be less than that considered critical for water, due to the greater density of the latter.

Laboratory Experiments

Recent laboratory experiments on a scrubber designed to conform with the computed velocity proved entirely satisfactory. An operating scrubber was then constructed to handle 35,000 M cu. ft. of gas per day at a gauge pressure of 400 pounds per square inch. After the scrubber was installed and placed in operation, a series of glass windows was placed in the discharge line through which observations were made to determine whether the scrubber was performing satisfactorily. The observations were made when the flow volumes were 29,000 M cu. ft. per day and 43,000 M cu. ft. per day, the operating pressure being 400 pounds gauge in both cases. The corresponding velocities under the pressure conditions were 164 feet per minute and 246 feet per minute. When the scrubber was operating at a lineal gas velocity of 164 feet per minute, the observations revealed that no free water or liquid was passing the scrubber, but when operating at a lineal velocity of 246 feet per minute, large quantities of water and oil were observed being carried into the transmission line by the gas stream. The velocity corresponding to the designed capacity was 198 feet per minte. It will be noted that the velocity computed by the formula is in substantial accord with the observed performance.

Scrubbers using the oil bath principle for the removal of dust and dirt have been found to be the most satisfactory. Here again it is important that the exist conditions be such that the scrubber liquid will not be carried away in the gas stream.

Should an analysis of the gas to be transported reveal that corrosive elements are contained therein, precaution should be taken to protect the transmission system from attack. Since the experiments previously referred to, as well as past experiences, indicate that internal corrosion cannot take place except in the presence of water in the liquid state, this source of trouble may be eliminated by partial dehydration of the gas before it enters the transmission system.

The development of means of preventing condensation within a transmission line involves a careful study of the relation between the flowing pressure and temperature of the gas, and its ability to hold water in the vapor state. Natural gas under given pressure and temperature conditions can carry a definite quantity of water in the vapor state. For the purpose of discussion, the following equation is referred to.

$$W = \frac{47.6\ Pv}{Pa} \text{ in which}$$

W = Weight of water in pounds per M cu. ft. of gas.
Pv = Vapor pressure of water at the gas temperature in pounds per square inch.
Pa = Absolute pressure of the gas in pounds per square inch.

The above formula is based on the assumption that the gas under investigation follows Boyle's Law. In the case of natural gas, a correction for super-expansibility must be made.

This equation can be used to calculate approximately the weight of water contained per M cu. ft. of gas at specific pressures and temperatures.

A gas is said to be saturated when for any given pressure and temperature relationship it can absorb no additional water. If a gas is saturated, and, in addition, is carrying water in the liquid state, it is said to be super-saturated. Furthermore, if a gas is saturated, any cooling will cause some of the water contained in the gas to pass from the vapor to the liquid state. The temperature at which water vapor begins to condense into liquid is said to be the dew point of the gas.

Factor Relationship

Returning for a moment to the equation, it will be noted that the factors have the following relationship. Since the vapor pressure of a liquid increases with the temperature, an increase in temperature would increase the value of Pv, indicating that a greater amount of water would be required to saturate a given volume of the gas. Should the temperature decrease, Pv would become smaller, indicating that a smaller amount of water would be required to saturate a given volume of the gas.

In connection with the effect of a changing operating pressure, it will be noted that as Pa increases the fraction $\frac{Pv}{Pa}$ becomes smaller, indicating that a smaller amount of water vapor can be held by a given volume of the gas. By the same token, a decrease in Pa increases the water vapor capacity of a given volume of the gas.

A knowledge of the foregoing simple statements of facts allows one to make use of ground temperature data to determine whether or not condensation will occur in a pipe line. The procedure is briefly as follows. The amount of water per unit volume of gas at the inlet end of the line is computed by the equation, or in the event the gas at the source is not saturated, it is determined by test. It is only necessary then to solve the equation for the amount of water per unit volume of gas at various known ground temperatures and pressures along the line. If it is found that W is less at any point in the system than at the source of supply, one may be sure that some of the water present as a vapor at the source will condense to the liquid state at that point.

When such a condition is discovered, and if it is known that the gas being handled contains corrosive elements, sufficient water must be extracted at the source to make W at that point less than at any other location in the system. This treatment is known as partial dehydration or dew point control.

It should be made clear that ground temperature data should consist, if possible, of at least one year's continuous record. Any such records showing daily variations of 3 or 4 degrees at a depth of 3 feet should be viewed with suspicion, and the recording thermometer checked against a maximum and minimum indicating thermometer.

Dehydrating Natural Gas

Several methods of dehydrating natural gas have been used with varying degrees of success. In certain locations the average wet bulb depression is such that satisfactory cooling may be obtained by the use of atmospheric cooling towers. Recent developments in cooling tower design and heat exchange equipment have made it possible to obtain a gas temperature within 5° of the wet bulb temperature, when the wet bulb is 60° F. or over, and to within 10° of the wet bulb temperature, when the wet bulk is 40° F. The gas leaving the heat exchanger in an atmospheric cooling tower is fully saturated at the pressure and temperature existing at the outlet of the heat exchanger, but as the gas flows through the line its pressure decreases and, as stated before, its ability to hold moisture increases. Unless ground temperatures are encountered which are lower than the gas temperatures at the site of the cooling tower, no condensation will occur. Temperatures lower than the dew point of the gas might be encountered in uncovered sections of the pipe line, but the effect of these temperatures may be reduced by insulating the exposed sections.

The atmospheric cooling tower, while entirely satisfactory under certain conditions, is dependent upon the wet bulb temperature for the final gas temperature, and during periods when the wet bulb is considerably above the average there might be condensation in the line. This is true due to the fact that while ground temperatures vary to a certain extent with atmospheric conditions at a depth of 3 feet, there might be but little chance for a wide change in wet bulb conditions.

In making studies of ground and wet bulb temperatures, little or no reliance should be placed upon spot readings. A continuous record of at least one year's duration should be used, and then only after the wet bulb record has been checked with U. S. Weather Bureau wet bulb records covering a period of several years.

The refrigeration process has also been used with a certain degree of success, and theoretically it should be possible to obtain any reasonable dew point desired using this method.

As a matter of fact, both of these processes of partial dehydration are limited by the formation temperature and pressure of natural gas hydrates which, as stated before, are 52° F. and 400 pounds pre square inch respectively for average California gas.

Adequate Control

If it develops that adequate control cannot be maintained by the atmospheric cooling or refrigeration systems, an absorption system employing calcium chloride brine can be used to control the dew point. With such a system it is possible to lower the dew point of the gas approximately 25°. With the cooling facilities existing at most plants, a

further lowering of the dew point of 25° would probably be sufficient to prevent condensation of any water vapor in the line. A description of such a plant and its cycle of operation is to be found in the December, 1935, issued of Western Gas.

Careful analyses of the gas should be made before deciding on the use of a calcium chloride brine system. There is ample evidence that corrosion will not occur in the system if there is no oxygen present in the gas, but we know that calcium chloride plants are subject to some limitations in handling gas of certain chemical characteristics. Oxygen present in the gas in sufficient quantities would probably cause active internal corrosion, hence it is necessary to carefully analyze the gas to be handled before selecting this system of dehydration. Where oxygen is found to be present, even in small quantities, the use of glycerine as the absorbing medium would probably be more desirable.

It is very important that the contactor be of sufficient size so that the velocity of the gas be reduced to such an extent that no calcium chloride brine or glycerine, as the case may be, is carried over into the transmission system. If some of the brine is carried over into the transmission system, it might, if not removed, become diluted by the absorption of water vapor from the flowing gas to the extent that it would cause excessive internal corrosion.

In the case of the loss of glycerine, no damage to the interior of the pipe line would result, but due to its high cost it would greatly increase the operating expense of the plant.

Properly designed scrubbers should be installed on the outlet of the atmospheric cooling and refrigerating systems to protect adequately the transmission system. If the gas to be treated by the absorption process is super-saturated, suitable scrubbers should be installed at the inlet of the plant in order that the absorbing medium will not be diluted unnecessarily.

Experience in Restoring Efficiency

While all that has been said thus far pertains to the factors affecting pipe line efficiency and means of their control, it might be interesting to describe somewhat in detail, a method which was recently employed to clear out the products of internal corrosion from a 20-inch line which showed a drop in flowing efficiency. An examination of the interior of this line showed that for a distance of approximately 17 miles from the high pressure end of the line, the interior was affected by internal corrosion, and the following method was used to remove the products of corrosion.

The pipe was cleared out in 5-mile sections between main line valves, each of which was equipped with 6-inch blow down connections on either side. A section about 12 feet long was cut from the pipe line approximately midway between the main line valves, and a special fitting for blowing the line installed at this location. This fitting consisted of a piece of 20-inch pipe with a bulkhead 1-inch thick in the center directly below the stack. On either side of the bulkhead a sloping baffle, made of one-half inch plate, extended from the top of the bulkhead to the bottom of the fitting and served to divert the flow up the stack. This type of fitting made it possible to blow from both directions with one installation.

Prior to Cleaning

Prior to cleaning operations, the line on either side of the section to be blown was packed with gas to about 350 pounds per square inch. The section to be cleaned was then blown down and the fitting installed after which about three sacks of steel shavings and lathe cuttings were forced into the line through the blow down connection at the main line valve. It is estimated that when these cuttings were forced into the pipe line they occupied 18 cubic feet of space.

The valve on the blow down connection at the main line valve was then closed and the main line valve opened as far as possible, forcing the steel cuttings through the line and out through the fitting in the middle of the section. Only steel shavings and lathe cuttings should be used for cutting out the products of corrosion as, due to the high velocities, pieces of steel of any appreciable weight might easily be blown through the walls of the pipe an angles in the line. That this might easily occur is verified by an incident which occurred while cleaning out one of the sections.

A piece of strap iron about one-half inch wide and 15 or 18 inches long, which had been folded over several times, was apparently unnoticed among the steel shavings inserted in the pipe and was therefore blown through the line. From a distance of 150 feet it was clearly heard when it struck the baffle plate of the special fitting. After the blow the fitting was examined and it was found that the baffle plate, which had been welded in the fitting for its entire circumference, had been torn loose from the pipe for about one-half of its circumference and pushed up against the bulkhead. The piece of strap iron was located later and was found to weigh only one-fourth of a pound.

It was of interest to note that after the blow very few pieces of the shavings of any length could be found, and these were almost straight. Also, the ground for several hundred feet from the fitting was found to be literally covered by small particles of metal about five-sixteenths inch long by three-sixteenths inch wide having a bluish cast indicating the heat that was developed by the friction between the cuttings and the interior wall of the pipe.

After the fitting was removed, the interior of the pipe line was examined as far as possible, and found to be entirely clean of the products of corrosion. The primary purpose of the blow was to remove these products thereby increasing the pipe line efficiency.

Pressure Surveys

Pressure surveys were made before and after the blow by installing recording gauges at various points along the line. The portion of the line cleaned was only about 25 per cent of the total length of the line in question, and while the overall flowing efficiency of the line when handling 60,000 M cu. ft. per day was increased about 4 per cent, the increase in efficiency in that portion of the line which was blown was about 15 per cent. It will be noted that blowing out that portion of the line which showed products of internal corrosion, increased the capacity of the line approximately 2,400 M cu. ft. per day. These figures are cited to show that the efficiency of a line can be improved by cleaning it out, and not for the purpose of showing what percentage of increased efficiency might be expected, as this would depend entirely on the pressures, volumes being handled and the extent of internal corrosion.

Summary and Conclusions

In summing up the text of this paper, the following brief review will recall the important points covered. The important controllable factors affecting pipe line flow efficiency are:

1. The accumulation of foreign matter consisting of dust, dirt, liquids and gas hydrates. These tend to reduce the sectional area of the gas passage and cause excessive pressure drop.

2. Internal corrosion, the products of which either adhere to the pipe wall and increase the coefficient of friction, or drop off and accumulate as in the case of foreign matter from other sources.

Means have been developed to counteract the effect of these actions. After a survey has been made to establish a basis to which fluctuations of efficiency can be compared, certain precautions can be taken to eliminate or minimize the factors tending to reduce the flowing efficiency. In the case of dust, dirt or liquid accumulations, adequate scrubbers will aid in preventing concentration of these materials.

However, where the formation of gas hydrates is involved, the only proven method known to the writer which can be used to advantage for maintaining the flowing efficiency, is partial dehydration by absorption.

Internal corrosion can be practically eliminated by partial dehydration. This may be accomplished by atmospheric cooling, refrigeration or absorption. Each method has its limits and possibilities.

In the case of reduction of flowing efficiency in an old line due to the accumulation of the products of corrosion on the inner wall, means have been developed for increasing the flowing efficiency by blowing steel shavings through the line. The method described is entirely feasible and practicable.

Canadian Provinces Planning Regulation of Gasoline

CHATHAM, Ontario, May 9.—A number of Canadian provincial governments are taking measures involving the stricter control and regulation of the sale of gasoline.

The initiative in this direction was taken a few years ago when the province of Nova Scotia provided for the licensing of vendors and the restriction of retail outlets with a view to eliminating overhead and securing a reduced price. At the same time distributing companies were forbidden to finance the purchase by service station operators of tanks, pumps and other equipment. Similar legislation was enacted by the province of New Brunswick; and Nova Scotia has recently interpreted its legislation as authority for control over gasoline prices.

The Ontario government has introduced a bill providing for much closer inspection and more completed returns of gasoline sales and a stricter administration of the gasoline tax. Another measure in Ontario provides that all persons selling gasoline, kerosene or distillate must be licensed, and licenses are also required for the blending of any constituent of gasoline with any other constituent or other substance for sale. Monthly returns are required and special attention is given to imports from outside the province.

This legislation also requires that all gasoline stored or offered for sale in Ontario shall be graded to such scale as the government regulations may prescribe; that importers, manufacturers, jobbers and vendors of gasoline must indicate the grade and price; and for fixing the grade or quality of gasoline which may be offered for sale. Under the legislation the Minister of Highways is empowered to prescribe the kind of equipment, containers and conveyances to be used; and can hold inquiries whenever he sees fit. These measures are intended to prevent the adulteration of gasoline and the evasion of the gasoline tax by the blending with gasoline of untaxed materials.

The province of Saskatchewan will probably enact a measure providing for the grading of gasoline and the licensing of retailers.

Alberta gasoline legislation is being drastically revised by the provincial legislature. Provision is made for the licensing of gasoline and fuel oil dealers and for empowering the Alberta Public Utilities Commission to regulate gasoline and oil prices. The legislation also empowers the government to refuse licenses where they are deemed unnecessary, and to undertake itself the wholesale and retail distribution of petroleum products.

Legality of Production

AUSTIN, Tex., May 11.—Affirmed in part and reversed and remanded in part was ordered Wednesday by the Third Court of Civil Appeals in the case of Railroad Commission and others vs. Haynes Drilling Co. from Travis County wherein a penalty of $500 has been paid in satisfaction for a judgment for 10,385 bbls. overproduction of oil contrary to the commission's allowables.

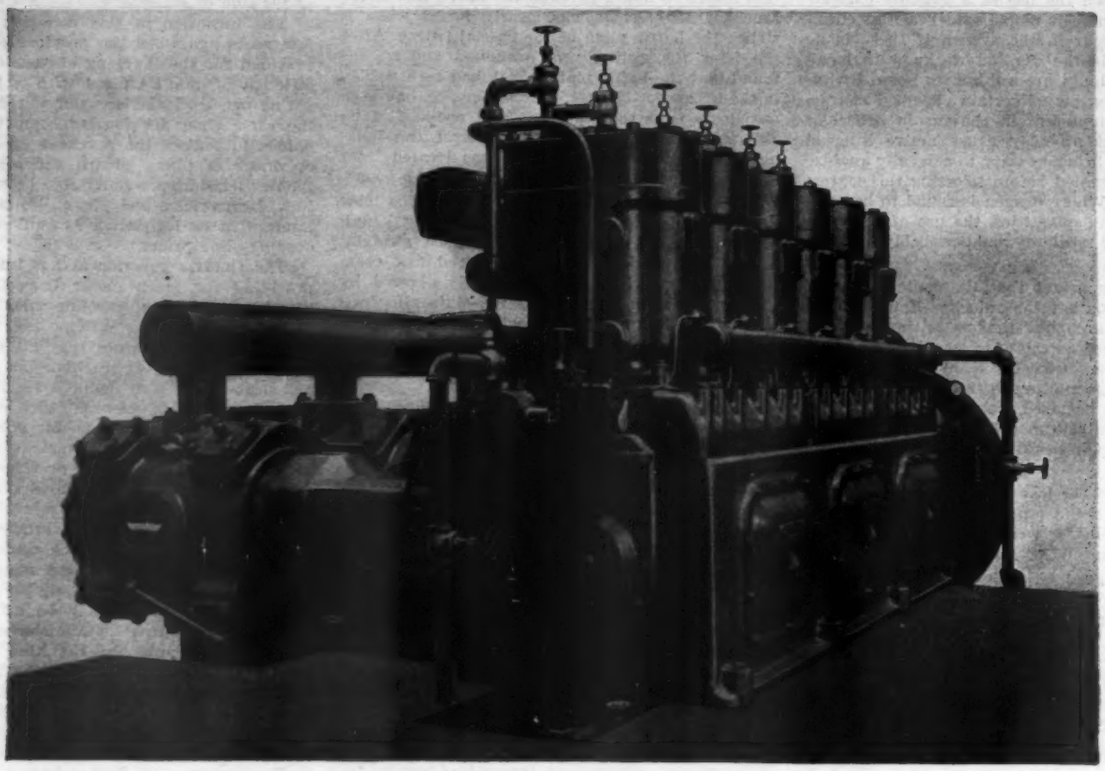
When the judgment was entered and satisfied the trial court held that as a matter of law the oil then became legal and was subject to transportation and sale by the owner.

The Appellate Court holds this to be erroneous and remands the case for trial with the burden on the owner of the oil to prove that it is legal and subject to transportation and market; also, with privilege to the state by cross-action to prove that the oil was illegally produced and subject to confiscation, as well as assert other rights.

Canadian Merger

CHATHAM, Ontario, May 9.—Shareholders of the Otterville Natural Gas Syndicate Nos. 2 and 3, operating in the Haldimand, Ontario, field, have voted to merge their interests in the Nottawa Oil & Gas Co., Ltd., which has been operating in the Hepworth area of Grey and Bruce Counties. Nottawa Nos. 7 and 8 are drilling, and tentative arrangements have been made for franchises. Officers of the Nottawa company are: President and field manager, A. B. Holmes; secretary, R. W. Little; directors, Gideon Kastner, Wiarton; P. L. Jackson, Dunnville; Roland Patterson, Owen Sound.

ANNOUNCING . . .



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International Petroleum Exposition to Open Its Gates Saturday, May 16

Tulsa starting Wednesday became the Mecca of thousands of oil men from all parts of the United States and many foreign countries who will visit the Oil Capital during the next 10 days.

Registrations on Wednesday were heavy in connection with the opening session of the Natural Gasoline Association of America and the committee meetings of the American Petroleum Institute which holds its principal business sessions on Thursday and Friday. The Natural Gasoline Association in its annual meeting presents its usual strong technical program in sessions which extend through Friday. Several outstanding papers are to be presented on producing and refining operations in connection with the semiannual meeting of the A.P.I. whose board of directors will meet on Thursday.

Advance registration indicate that Tulsa's capacity as host will be extended to its limit starting Saturday, the opening day of the Ninth Annual Petroleum Exposition which extends through May 23. The exposition gates will open at 9:30 a.m. on what is expected to be the industry's largest attended exposition with the opening ceremony at 2:00 p.m. when W. A. Irvin, president of the United States Steel Corp., will deliver the principal address.

The several hundred manufacturing and supply companies the middle of the week were rapidly completing the installation of their exhibits which will furnish visitors with a complete panorama of the latest developments in the oil industry's major equipment and operating methods. The scope of the exhibits which are valued at approximately $1,000,000 exceeds that of any previous exposition.

Special attention has been given in the ninth exposition to scientific and technical equipment. Thousands of technical men from the laboratories, fields and plants as well as students from universities are to take full advantage of this particular feature of the exposition where the use of latest developments in scientific instruments in all branches of the industry will be demonstrated.

"Old Timers" will be honored on several occasions during the week with an opening ceremony at the exposition grounds on Sunday afternoon. Medals to "Old Timers" will be awarded Tuesday afternoon. Teams from several oil companies will

A. G. HEGGEM
Vice President

W. G. SKELLY
President, International Petroleum Exposition

F. J. HINDERLITER
Vice President

W. K. WARREN
Host for Day, Sunday, May 17

R. B. PRINGLE
Host for Day, Monday, May 18

RALPH O. DIETLER
Host for Day, Tuesday, May 19

participate in the safety contests with awards to winners Friday evening.

As shown in the accompanying complete program for the 10 days starting Wednesday several associations and technical groups will hold meetings and dinners during the exposition. An outstanding event in connection with the first American meeting will be the dinner Friday, May 15 of the Institution of Petroleum Technologists.

The Independent Petroleum Association of America, the National Stripper Well Association, the International Petroleum Exposition, the Association of Drilling Contractors, and 18 other local, state, and area oil and gas associations will jointly hold a banquet at Tulsa on Thursday evening, May 21. John M. Lovejoy, president of the American Institute of Mining and Metallurgical Engineers, will discuss "The Relation of the Technical Problems of the Petroleum Industry to its Economic Problems" at this meeting.

Charles L. McMahon, chairman of the Tulsa Committee on Arrangements for this event, has announced that J. Wood Glass, president of the Northeastern Oklahoma Stripper Well Association, will preside at the banquet and Charles F. Roeser, president of the Independent Petroleum Association of America, will act as toastmaster.

Program for Mid-Year Meeting American Petroleum Institute Divisions, Mayo Hotel, Tulsa, May 14-15

Thursday, May 14, 1936

9:00 A.M.
(All meetings at Mayo Hotel)

PRODUCTION DIVISION

DRILLING AND PRODUCTION PRACTICE: (16th Floor—Crystal Ball Room)
(Sponsored by the Central Committee on Drilling and Production Practice.)
Presiding: F. W. Floyd, the Carter Oil Co.

Economic Life of Sucker Rods.
Emory Kemler, Gulf Oil Corp. of Pennsylvania.

Back-Side Crank Pumping and Catenary Rod Lines.
R. E. Bridges, Humble Oil & Refining Co.

Application of Multi-cylinder Gas Engines.
D. G. Kingman, General Petroleum Corp. of California.

Casing-Line Data and Application.
Roy B. Southworth, Columbia Steel Co.

10:00 A.M.

REFINING DIVISION

LUBRICATION: (Mezzanine Floor—Junior Ball Room)
Presiding: J. B. Rather, Socony-Vacuum Oil Co., Inc.

Axle Design as Affecting Lubrication Problems.
W. R. Griswold, Packard Motor Car Co.

Fundamentals of Solvent Refining.
John M. Poole.

10:00 A.M.

BOARD OF DIRECTORS (16th Floor—Lounge Room)

Thursday, May 14, 1936

2:00 P.M.

PRODUCTION DIVISION

DRILLING AND PRODUCTION PRACTICE: (16th Floor—Crystal Ball Room)
(Sponsored by the Central Committee on Drilling and Production Practice.)
Presiding: J. T. Hayward, Barnsdall Oil Co.

Rotary-Drilling Practices.
J. E. Brantly, Drilling & Exploration Co.

Welded Joints for Oil-Well Casing.
Marvin Cook, Humble Oil & Refining Co.

Use of Recording Pressure Gauges in Drill-Stem Tests.
R. S. Christie, Amerada Petroleum Corp.

Pressure Completion of Wells in the Fitts Pool.
K. R. Tels, E. H. Moore, Inc.

2:00 P.M.

REFINING DIVISION

MISCELLANEOUS: (Mezzanine—Junior Ball Room)
Presiding: Frank E. Holsten, Barnsdall Refining Corp.

Color Restoration of Gasoline and Kerosine in the Field.
J. B. Rather and L. C. Beard, Jr., Socony-Vacuum Oil Co., Inc.

Controlled Disposal of Waste vs. Pollution.
W. B. Hart, the Atlantic Refining Co.

Clay Treating of Motor Fuels.
M. R. Mandelbaum, the Gray Process Corp., and P. F. Swanson, M. W. Kellogg Co.

Instrumentation in Oil Refining.
A. C. Proctor and Gustav Egloff, Universal Oil Products Co.

7:00 P.M.

COMPLIMENTARY DINNER (Coliseum)
The local oil companies in Tulsa have arranged for a complimentary dinner and entertainment, at the Coliseum, for the out-of-town members attending the Sixth Mid-Year Meeting. It will be informal. Those who expect to attend will be requested to so indicate at the time of registration.

Friday, May 15, 1936

9:00 A.M.

PRODUCTION DIVISION

DRILLING AND PRODUCTION PRACTICE: (16th Floor—Crystal Ball Room)
(Sponsored by the Central Committee on Drilling and Production Practice.)
Presiding: H. H. Power, Gulf Oil Corp. of Pennsylvania.

Productivity Index.
M. L. Haider, the Carter Oil Co.

A Precision Gage for Sub-surface Pressure Measurements.
Paul G. Exline, Gulf Research & Development Corp.

Nickel-Alloy Steels in Drilling Equipment.
A. G. Zima, International Nickel Co.

Degree of Reduction of Sediments in the East Texas Basin as an Index of Source Beds.
Parker D. Trask, U. S. Geological Survey, and W. Ross Keyte, A.P.I. Research Fellow.

10:00 A.M.

REFINING DIVISION

DEWAXING: (Mezzanine Floor—Junior Ball Room)
Presiding: G. G. Oberfell, Phillips Petroleum Co.

The Solvent Dewaxing Process.
W. P. Gee, W. Kiersted, and B. Y. McCarty, The Texas Co.

Propane De-asphalting and Dewaxing of Mid-Continent Residuum by Use of Propane.
A. P. Anderson, Shell Petroleum Corp.; H. O. Forrest and Lee Van Horn, M. W. Kellogg Co.

Activities of the Week

WEDNESDAY, MAY 13

10:00 a.m. Natural Gasoline Association of America, opening session, Hotel Tulsa.
1:00 p.m. Natural Gasoline Association of America, afternoon session, Hotel Tulsa.

THURSDAY, MAY 14

9:00 a.m. Natural Gasoline Association of America, morning session, Hotel Tulsa.
9:30 a.m. American Petroleum Institute, sixth mid-year meeting, Production Division, Drilling Practice, Mayo Hotel, sixteenth floor.
10:00 a.m. American Petroleum Institute, Refining Division, Lubrication, Mayo Hotel, Mezzanine.
10:00 a.m. American Petroleum Institute, Board of Directors, Mayo Hotel, Lounge room.
1:00 p.m. Natural Gasoline Association of America, afternoon session, Hotel Tulsa.
2:00 p.m. American Petroleum Institute, Production Division, Production Practice, Mayo Hotel, sixteenth floor.
2:00 p.m. American Petroleum Institute, Refining Division, Miscellaneous, Mayo Hotel, Mezzanine floor.
7:00 p.m. American Petroleum Institute Entertainment, Coliseum.

FRIDAY, MAY 15

9:00 a.m. Natural Gasoline Association of America, morning session, Hotel Tulsa.
9:30 a.m. American Petroleum Institute, Production Division, Production Allocation and Problems and Research, Mayo Hotel, sixteenth floor.
10:00 a.m. American Petroleum Institute, Refining Division, Dewaxing, Mayo Hotel, Mezzanine floor.
1:00 p.m. Natural Gasoline Association of America, afternoon session, Hotel Tulsa.
6:00 p.m. Institution of Petroleum Technologists, London (first American meeting), dinner and meeting, Mayo Hotel.

SATURDAY, MAY 16

REFINERS DAY, W. G. SKELLY, President, Skelly Oil Co., Host.
DIRECTORS OF THE DAY: Clyde Alexander, R. H. Bartlett, Frank R. Billingslea, Allmand M. Blow, A. F. Bourne, W. M. Bovaird, A. E. Bradshaw, J. H. Brooks, E. J. Bullock and W. L. Connelly.
IN HONOR OF: West Virginia, Pennsylvania.
Sistersville, Clarkesburg, Oil City, Bradford, Titusville, Franklin.
9:30 a.m. Exposition gates open.
2:00 p.m. Opening ceremony in charge of the American Legion. W. A. Irvin, President of United States Steel Corp., will give the opening address.
3:00 p.m. Registration of delegates from foreign countries, Exposition office at grounds.
4:00 p.m. Registration of "Old Timers" of the Petroleum Industry in Replica of Old Drake Well, Exposition grounds.
6:30 p.m. Band Concert, Exposition grounds.

SUNDAY, MAY 17

NATURAL GASOLINE DAY, W. K. Warren, President Warren Petroleum Co., Host.
DIRECTORS FOR THE DAY: O. T. Dawson, R. E. Day, C. P. Dimit, Ray L. Dudley, George A. Day, R. S. Ellison, W. S. Farish, Harold B. Fell, E. R. Filley and W. S. Fitzpatrick.
IN HONOR OF: California, Oklahoma.
Los Angeles, Seminole, Drumright, Ada, Glenpool, Cushing, Fairfax.
9:30 a.m. Exposition gates open.
3:00 p.m. Ceremony dedicated to "Old Timers," Exposition grounds, Rev. Guy Tetirick, Chairman.
6:30 p.m. Band Concert, Exposition grounds.
8:45 p.m. Oil Fire Demonstration, Tulsa State Fair Grandstand.

MONDAY, MAY 18

PRODUCTION AND PURCHASING AGENTS DAY, R. B. Pringle, Vice President, Tide Water Oil Co., Host.
DIRECTORS FOR THE DAY: J. P. Flanagan, Walter Fleming, C. W. Flint, H. V. Foster, Jacob France, Wirt Franklin, J. H. Gardner, Robert F. Garland, J. Burr Gibbons and Walter Gray.
IN HONOR OF: Michigan, Ohio.
Findlay, Muskegon.
9:30 a.m. Exposition gates open.
10:00 a.m. Junior Chamber of Commerce Young Oil Men's Day, Registration, Lobby, Third Floor, Tulsa Building.
Student Engineers day, sponsored by University of Tulsa.
12:00 noon Luncheons: Civitan Club, Alvin Hotel; Kiwanis Club, Mayo Hotel.
2:00 p.m. to 4:00 p.m. Junior Chamber of Commerce Young Oil Men's Trip Through the Diamond D-X Refinery.
6:30 p.m. Band Concert, Exposition grounds.
8:30 p.m. Junior Chamber of Commerce, Young Oil Men's Stag Party, University Club, Tap room.

TUESDAY, MAY 19

PIPE LINE DAY, R. O. Dietler, Vice President of Stanolind Crude Oil Co., Host.

R. W. McDOWELL
Host for Day, Wednesday, May 20

A. O OLSON
Host for Day, Thursday, May 21

W. R. FRANCISCO
Host for Day, Friday, May 22

DIRECTORS FOR THE DAY: Rush Greenslade, Henry Greis, L. S. Gregory, S. A. Guiberson, Jr., P. D. Hayes, J. M. Hayner, Alf G. Heggem, J. H. Hill, Frank J. Hinderliter and B. E. Horrigan.

IN HONOR OF: Kentucky, Kansas.
Bowling Green, Owensboro, Wichita, Eldorado, McPherson, Ashland, Hayes, Hutchinson.

12:00 noon Luncheons: Junior Chamber of Commerce, Chamber of Commerce dining room; Traffic Club, Mayo Hotel.
Junior Chamber of Commerce, Young Oil Men's Luncheon, Chamber of Commerce dining room, fourth floor, Tulsa Building.

1:30 p.m. Junior Chamber of Commerce, Young Oil Men's Trip to Beggs, Oklahoma, for Seismograph demonstration through courtesy of Seismograph Corp.
Dinner for foreign delegates.

6:00 p.m. Purchasing Agents Association of Tulsa and Oil Company Buyers Group of the National Association of Purchasing Agents, Tulsa Club.

6:30 p.m. Band Concert, Exposition grounds.

8:30 p.m. Junior Chamber of Commerce, Young Oil Men's Dance, Crystal Ballroom, Mayo Hotel, sixteenth floor.

WEDNESDAY, MAY 20

MARKETERS DAY, R. W. McDowell, Vice President of Mid-Continent Petroleum Corp., Host.

DIRECTORS FOR THE DAY: Fred W. Insull, Roy B. Jones, P. C. Lauinger, Clarel B. Mapes, Joseph R. McGraw, D. F. McMahon, Walter Miller, E. H. Moore and William D. Moorer.

IN HONOR OF: Texas, Louisiana.
Midland, Amarillo, Houston, Fort Worth, Dallas, San Antonio, Monroe, Longview, Tyler, Shreveport, Kilgore, Oklahoma City.

8:00 a.m. Golf tournament opens, Tulsa Country Club, Frank Gray, Chairman.

9:30 a.m. Exposition gates open.

12:00 noon Luncheons: American Business Club, Alvin Hotel; Cooperative Club, Chamber of Commerce; Engineers Club of Tulsa, Brittlings; Lions Club, Mayo Hotel; Optimist Club, Hotel Tulsa; Rotary luncheon for foreign delegates, Hotel Tulsa.

6:30 p.m. Band Concert, Exposition grounds.

8:45 p.m. Oil Fire Demonstration, Tulsa State Fair grounds.

THURSDAY, MAY 21

DRILLING CONTRACTORS DAY, A. O. Olson, President of Olson Drilling Co., Host.

DIRECTORS FOR THE DAY: C. Morris, W. J. Morris, E. J. Nickols, C. H. Pape, George Parker, F. B. Parriott, A. W. Peake, J. Edgar Pew and Henry L. Phillips.

IN HONOR OF: Colorado, Arkansas, Illinois.
Denver, El Dorado, Casey, Robinson.

8:00 a.m. Golf Tournament, Tulsa Country Club.

9:00 a.m. Exposition gates open.

9:00 a.m. Independent Petroleum Association of America, Mayo Hotel. Committee meetings.

10:00 a.m. Independent Petroleum Association of America, Mayo Hotel.

9:30 a.m. to 4:30 p.m. Safety Conference, Topaz Room, Hotel Tulsa.

12:00 noon Luncheons: Cosmopolitan Club, Hotel Tulsa; Hi-Twelve, Hotel Tulsa; Tulsa Geological Society, Chamber of Commerce.

12:30 p.m. Independent Petroleum Association of America, Directors luncheon and meeting, Mayo Hotel.

1:30 p.m. Awarding of medals to "Old Timers," Exposition grounds.

2:00 p.m. Independent Petroleum Association of America, meeting of Executive Committee, Mayo Hotel.

6:00 p.m. Independent Petroleum Association of America, Reception.

6:30 p.m. Band Concert, Exposition grounds.

7:00 p.m. Independent Petroleum Association of America, Banquet, Mayo Hotel.

FRIDAY, MAY 22

OIL SCOUTS AND GEOLOGISTS DAY, W. R. Francisco, Secretary-Treasurer, Deep Rock Oil Co., Host.

DIRECTORS FOR THE DAY: Waite Phillips, Warren C. Platt, F. O. Prior, Edward E. Robbins, Harry H. Rogers, E. J. Salrin, J. H. Satterwhite, W. A. Schlueter and E. J. Sadler.

IN HONOR OF: Wyoming, New Mexico.
Casper, Gallup, Roswell, Carlsbad.

8:00 a.m. Golf Finals, Tulsa Country Club.

9:30 a.m. Exposition gates open.

10:00 a.m. Tour of exhibits at Exposition rounds by Safety group. National Stripper Well Association.

12:00 noon Luncheons: Chamber of Commerce, Tulsa Building, Special Exposition program.

2:00 p.m. First Aid Contest, Demonstration, Exposition grounds.

6:30 p.m. Band Concert, Exposition grounds.

7:30 p.m. First Aid Meet Banquet, and awarding of medals, Topaz Room, Hotel Tulsa.

SATURDAY, MAY 23

GENERAL OIL INDUSTRY DAY, E. B. Reeser, President of Barnsdall Oil Corp., Host.

DIRECTORS FOR THE DAY: R. C. Sharp, J. S. Sidwell, Earl Sneed, Hugh Stalcup, O. C. Staples, Jay P. Walker, M. F. Waters, T. R. Weymouth and H. C. Weiss.

IN HONOR OF: Montana, Mississippi, New York.
Great Falls, Billings, Jackson, Olean, Corning.

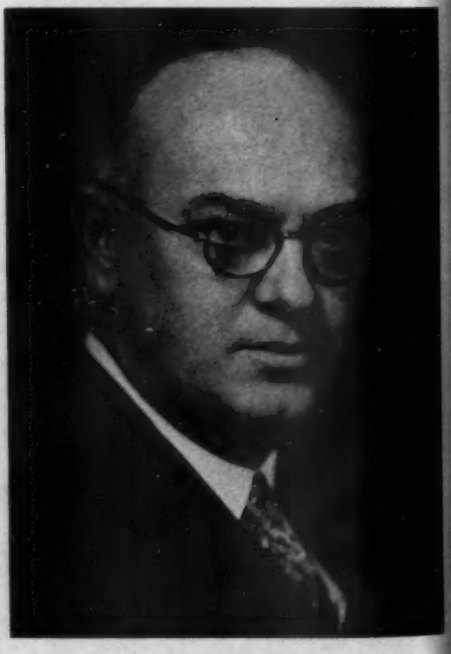
9:30 a.m. Exposition gates open.

6:30 p.m. Band Concert, Exposition grounds.

6:30 p.m. Petroleum Group of Oklahoma Section, American Chemical Society, Alvin Hotel.

E. B. REESER
Host for Day, Saturday, May 23

W. B. WAY
General Manager



C. F. ROESER
President, I. P. A. A.

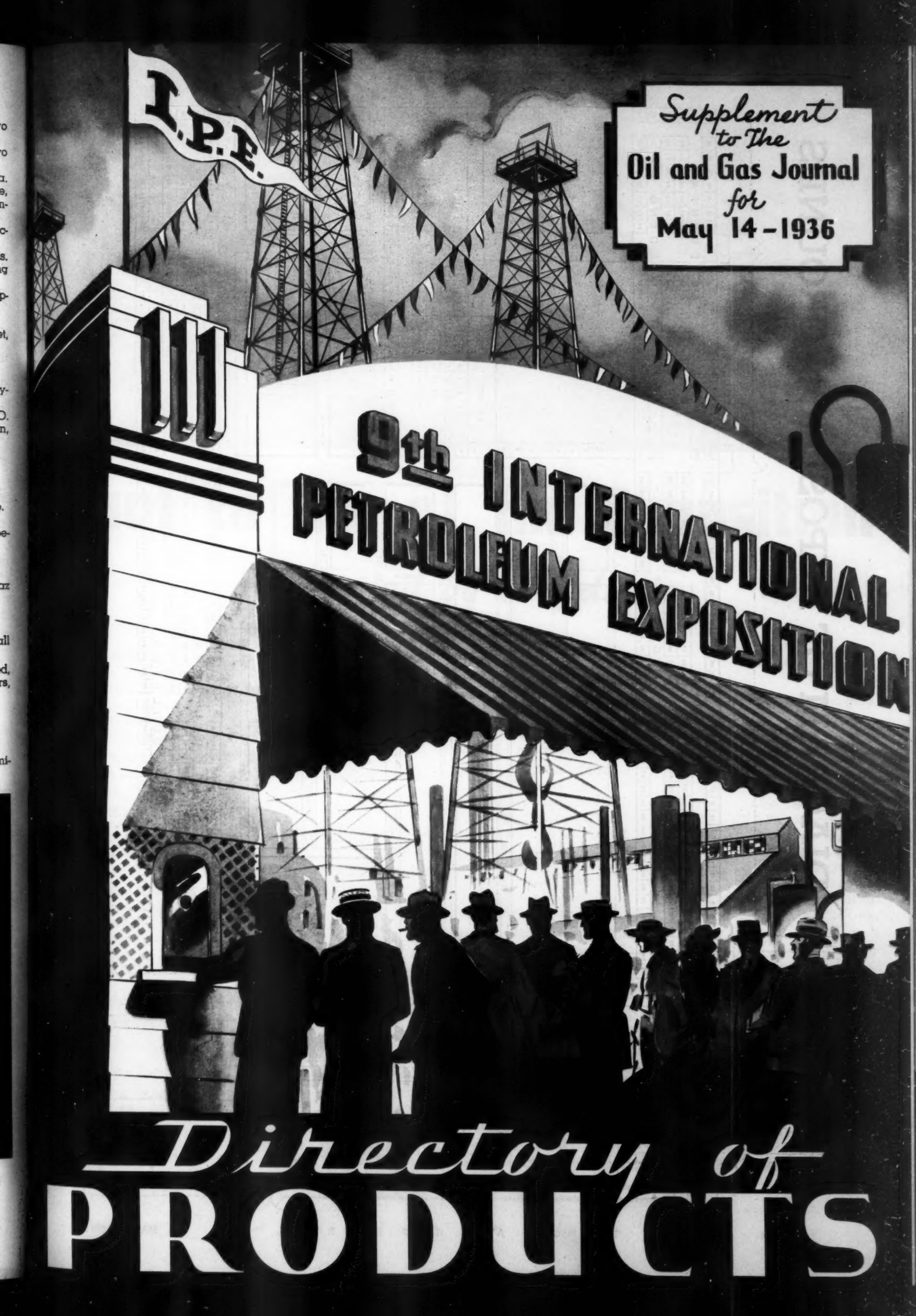
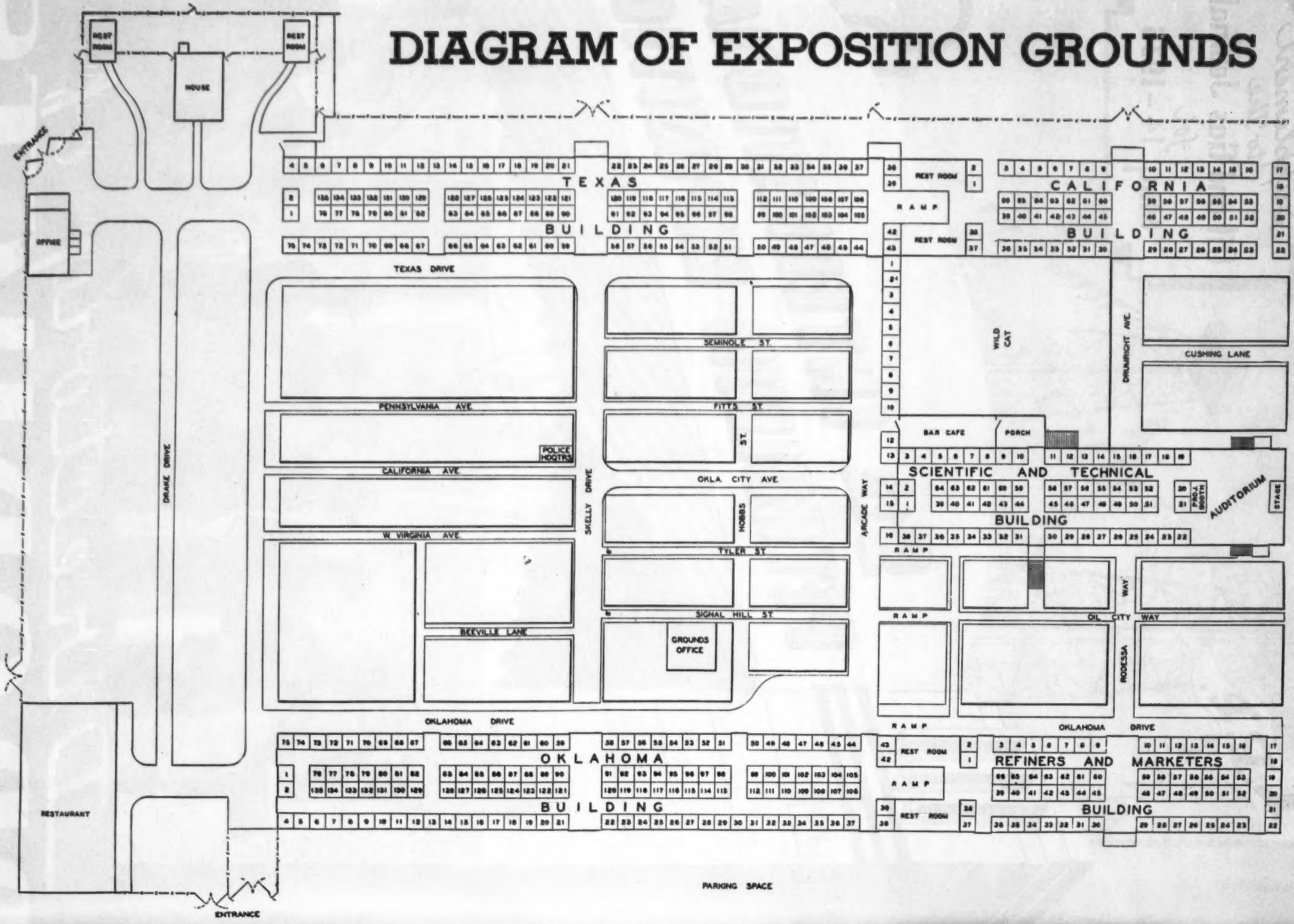
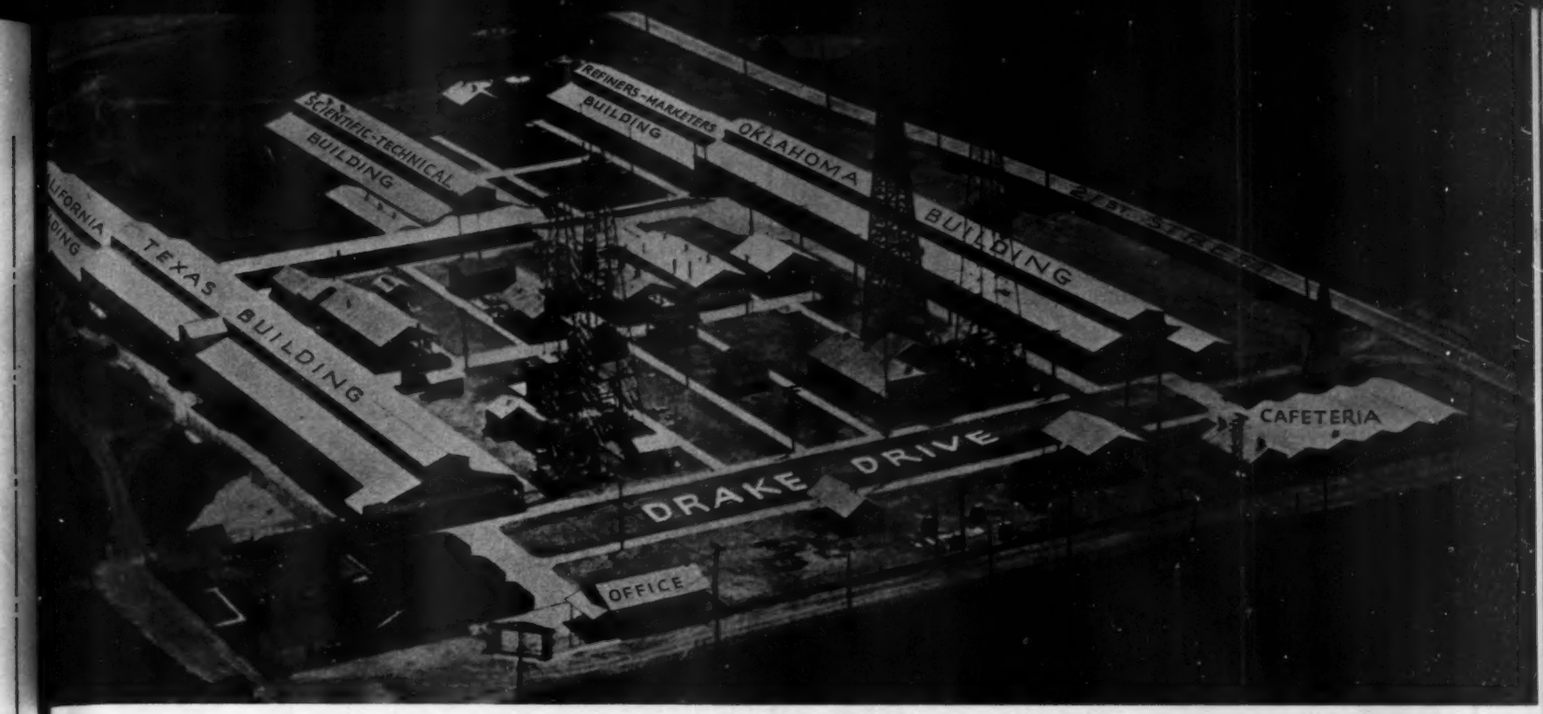

I.P.E.
Supplement to The Oil and Gas Journal for May 14 - 1936
9th INTERNATIONAL PETROLEUM EXPOSITION
Directory of
PRODUCTS

DIAGRAM OF EXPOSITION GROUNDS





What to See at the Exposition

Arranged by Products

ABSORBERS

Black, Sivalls & Bryson, Inc. ..... Booths 39-66, California Bldg.
National Tank Co. ..... Booths 96-115, Texas Bldg.; 9 Oil City Way
Tulsa Boiler & Machinery Co. ..... 3 California Ave.
Vogt Machine Co., Henry ..... Booth 128, Oklahoma Bldg.
Worthington Pump & Machinery Corp. ..... 4 Skelly Drive

ACETYLENE

Air Reduction Sales Co. ..... Booths 31-33, California Bldg.
Union Carbide & Carbon Co. ..... Booths 6, 7, 8, 9, California Bldg.

ACIDIZING

Dowell, Inc. ..... Booths 28-29, California Bldg.

AIRPLANES

Spartan Aircraft Co. ..... Booths 46-59, Refiners & Marketers Bldg.

BACKFILLERS—PIPE LINE

Allsteel Products Mfg. Co. ..... 9 Arcade Way
Barber-Greene Co. ..... 13 Oil City Way
Buckeye Traction Ditcher Co. ..... 3 Pennsylvania Ave.
Cleveland Trencher Co. ..... 1 Oil City Way
Harnischfeger Sales Corp. ..... 8 Seminole St.
Trackson Co. ..... 8 Tyler St.
W-K-M Co., Inc. ..... Booths 60, 61, 62, 43, 44, 45, California Bldg.

BALL JOINTS—FLEXIBLE

Barco Mfg. Co. ..... Booths 90-122, Texas Bldg.
Crane Co. ..... Booths 50-55, Refiners & Marketers Bldg.
Smith Separator Corp. ..... Booths 90-122, Texas Bldg.

BALLS & SEATS

Axelson Mfg. Co. ..... 1 Drake Drive
Baird Mfg. Co. ..... Booth 9, Arcade
Bradford Motor Works ..... 6 Drake Drive
Hough Mfg. Co., Chas. N. ..... Booths 123-124, Texas Bldg.
O'Bannon Co., Walter ..... Booth 104, Texas Bldg.

BARGES—OIL

American Bridge Co. ..... Booths 93 to 118, Incl., Oklahoma Bldg.

BARRELS & DRUMS

Wackman Welded Ware Co. ... Booth 7, Refiners & Marketers Bldg.
Wilson & Bennett Mfg. Co. .... Booth 39, Refiners & Marketers Bldg.

BARRELS—CORE

Baker Oil Tools, Inc. ..... Booths 99-112, Oklahoma Bldg.
Bridgeport Machine Co. ..... 6 Drake Drive
Cameron Iron Works Co. ..... 7 Pennsylvania Ave.
Failing Supply Co., Geo. E. ..... 5 Oil City Way
Hughes Tool Co. ..... Booths 91-93, Texas Bldg.
Hydril Co. ..... Booths A-B, Outside Texas Bldg.
Lucey Products Corp. ..... 8 Oil City Way
Reed Roller Bit Co. ..... Booths 12, 13, 14, Texas Bldg.
Sullivan Machinery Co. ..... 3 Beeville Lane

BARRELS—WORKING

Axelson Mfg. Co. ..... 1 Drake Drive
Bradford Motor Works ..... 6 Drake Drive
Bridgeport Brass Co. ..... Booth 8, Arcade
D. & B. Pump & Supply Co. ..... Booths 7-8, Continental Supply Bldg.
Hough Mfg. Co., Chas. N. ..... Booths 123-124, Texas Bldg.
Norris Manufacturer, W. C., Inc. ..... Booths 8-11, Arcade Way
O'Bannon, Walter, Co. ..... Booth 104, Texas Bldg.

BATTERIES

Gates Hardware Co. ..... 13 Skelly Drive
Willard Storage Battery Co. ..... Booth 34, California Bldg.

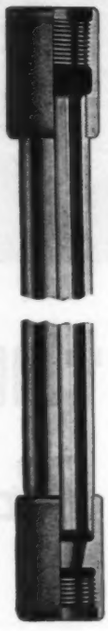
BEARINGS—BALL & ROLLER

Ahlberg Bearing Co. ..... Booth 32, Texas Bldg.
American Roller Bearing Co. .... Booth 9, Refiners & Marketers Bldg.
Hyatt Roller Bearing Co. ..... Booths 108-109, Texas Bldg.

Illustrations and information by courtesy of the International Petroleum Exposition, and every possible effort has been made to avoid errors in the compilation of this material

"Inside Information"

We know what goes on inside your well. And we know what it takes to "cut down your underground overhead." That's why we've been able to build *better pumping equipment* ever since 1901. A partial list:



● *Huf-Duo Insert Pump* (at left) prevents sanding, saves time and labor, insures long life. Power consumption and rod stress are less than with an ordinary pump. Made for 2", 2½" and 3" tubing.

● *Hough Specialized Balls and Seats* (upper right) are guaranteed tight. All seat surfaces are ground to close limits. Five distinct types meet the entire range of operating conditions.

● *Huf-Stripper Insert Pump* (lower right) for stripper wells or continuous pumping of deep wells. Low cost; saves power; reduces rod breakage; minimizes trouble. Two sizes: 1" and 1 3/8"—for 2" tubing.

● *Hough Seamless Steel Working Barrels* (right center) are made to A.P.I. specifications from highly specialized cold-drawn tubing. In all standard sizes with smooth, bright bore or with chromium-plated bore.

● *Huf-Supersize Insert Pump* is a large-capacity insert-type working barrel. It is a complete unit, run in and pulled out of the well on the sucker rods, and eliminates many tubing jobs. For 2½" and 3" tubing.

● *Hough Working Barrel Valves* are close fitting and efficient. Several various types and a complete range of sizes. Made to A.P.I. specifications in steel. Bronze valves or bronze parts can be supplied.

Oil Field Distributors Carry Hough Products in Stock

THE CHARLES N. HOUGH MFG. CO.
FRANKLIN, PA.

See us at the International Petroleum Exhibition at Tulsa, May 16-23. Booths 123-124.

H O U G H
OIL WELL SPECIALTIES

Norma-Hoffman Bearing Corp. ..... Booth 8, Texas Bldg.
SKF Industries, Inc. ..... Booths 67-68, Texas Bldg.
Stone Bearing Co. ..... Booth 32, Texas Bldg.
Timken Roller Bearing Co. ..... Booths 72-73, Texas Bldg.
Tyson Roller Bearing Co. ..... Booth 26, California Bldg.

BELTING

Alexander Bros. ..... Booths 45-60, California Bldg.
Allis-Chalmers Mfg. Co. (Motor), ... 2 Oil City Way
Bridgeport Machine Co. ..... 6 Drake Drive
Dayton Rubber Mfg. Co. ..... Booths 14-15, California Bldg.
Dodge Mfg. Co. ..... Booths 4-5, California Bldg.
Garlock Packing Co. ..... Booths 59-60, Texas Bldg.
Goodrich Rubber Co., B. F. ..... Booth 43, Texas Bldg.
Goodyear Tire & Rubber Co. ..... Booths 52, 53, 54, Texas Bldg.
Gustin-Bacon Mfg. Co. ..... Booths 52, 53, 54, Texas Bldg.
Happy Belting Co. ..... Booths 1-2, Oklahoma Bldg.
Hewitt Rubber Corp. ..... Booths 79-132, Texas Bldg.
Manhattan Rubber Mfg. Division ..... 5 Drake Drive
Mechanical Rubber Co. ..... Booth 11, Continental Supply Bldg.
Republic Rubber Co. ..... Booths 25, 26, 27, Texas Bldg.
Thermoid Rubber Co. ..... 3 Drake Drive

BITS

American Iron & Machine Works .... Booths 51-52, Oklahoma Bldg.
Baash-Ross Tool Co. ..... Booth 69, Texas Bldg.
Baker Oil Tools, Inc. ..... Booths 99-112, Oklahoma Bldg.
Beaumont Iron Works Co. ..... 1 Drake Drive
Bridgeport Machine Co. ..... 6 Drake Drive
Byron Jackson Co. ..... Booths 25-28, Oklahoma Bldg.
Cameron Iron Works Co. ..... 7 Pennsylvania Ave
Chiksan Oil Tool Co., Ltd. .... Booths 25-26, Refiners & Marketers Bldg.
Emsco Derrick & Equipment Co. ..... 2 Drake Drive
Hinderliter Tool Co. ..... Booths 22-24, Texas Bldg.
Hughes Tool Co. ..... Booths 91, 92, 93, Texas Bldg.
International Derrick & Equipment Co. ..... 10 Drake Drive
Iverson Tool Co. ..... Booth 49, California Bldg.
MacClatchie Mfg. Co. ..... 2 Drake Drive
Reed Roller Bit Co. ..... Booths 12, 13, 14, Texas Bldg.
Spang & Co. ..... Booths 47-58, California Bldg.
Titusville Iron Works Co. ..... 6 Beeville Lane
Universal Engineering Co., Ltd. ..... Booth 117, Texas Bldg.

BLOCKS—CROWN & TRAVELING

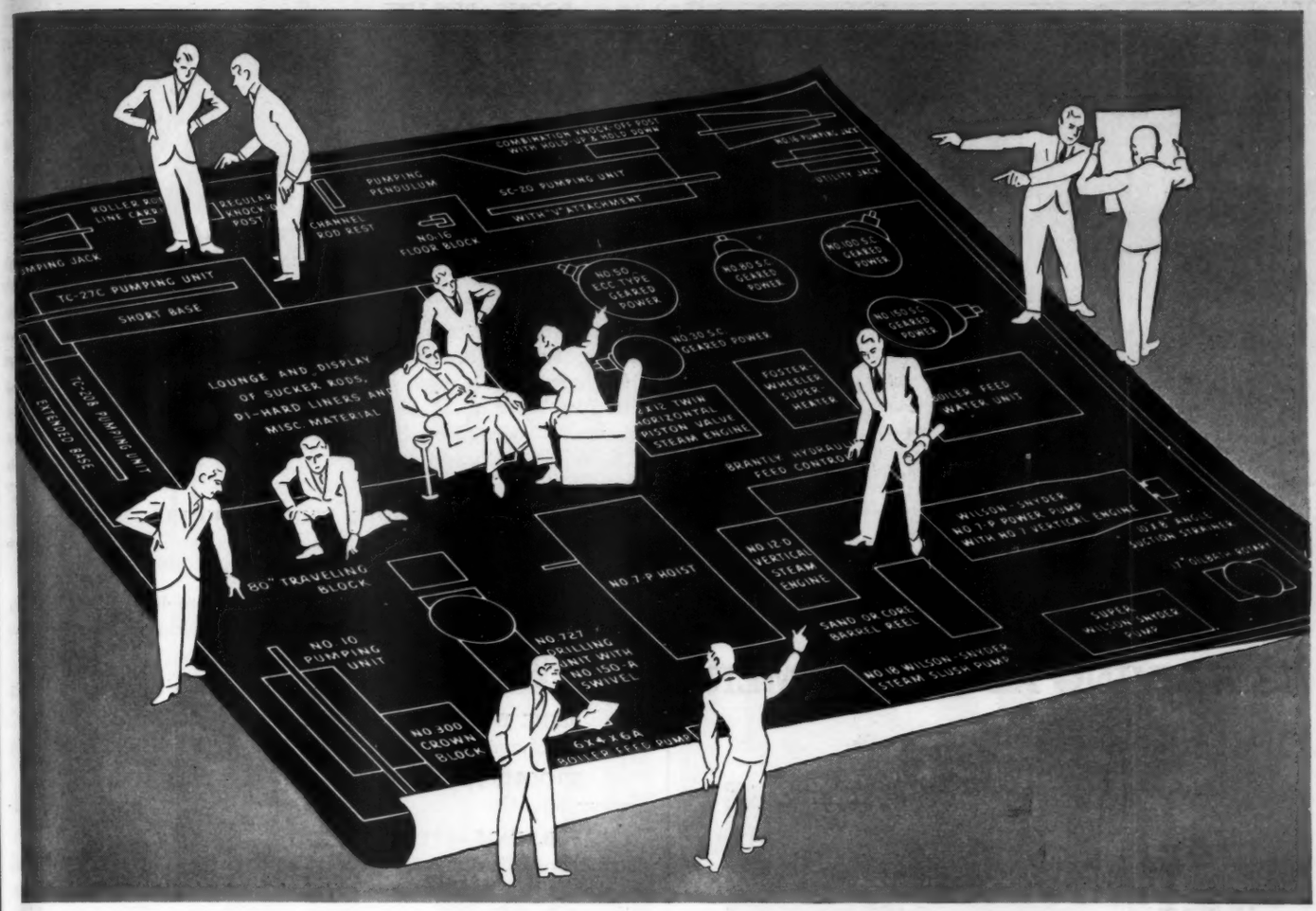
Baash-Ross Tool Co. ..... Booth 69, Texas Bldg.
Beaumont Iron Works Co. ..... 1 Drake Drive
Brauer Machinery & Supply Co. ..... Booth 16, California Bldg.
Emsco Derrick & Equipment Co. ..... Continental Supply Exhibits
International Derrick & Equipment Co. ..... 10 Drake Drive
Lucey Products Corp. ..... 8 Oil City Way
Moore & Co., Lee C. ..... Booths 65-66, Oklahoma Bldg.
Muskogee Iron Works ..... 9 Skelly Drive
Parkersburg Rig & Reel Co. .. Booths 74-75, Texas Bldg., 12 Drake Drive
Titusville Iron Works Co. ..... 6 Beeville Lane

BLOCKS, PILLOW

Ahlberg Bearing Co. ..... Booth 32, Texas Bldg.
Dodge Mfg. Co. ..... Booths 4-5, California Bldg.
Link-Belt Co. ..... Booths 61, 62, 63, Texas Bldg.
Norma-Hoffman Bearing Co. ..... Booth 8, Texas Bldg.
Stone Bearing Co. ..... Booth 32, Texas Bldg.

BOILERS—OIL COUNTRY

Beaumont Iron Works Co. ..... 1 Drake Drive
Bridgeport Machine Co. ..... 6 Drake Drive
Broderick Co. ..... 5 Drake Drive
Farrar & Trefts, Inc. ..... 2 Drake Drive
International Derrick & Equipment Co. ..... 10 Drake Drive
Lucey Products Corp. ..... 8 Oil City Way
National Radiator Corp. ..... Booths 12-13, California Bldg.
Oil Well Supply Co. ..... 3 Drake Drive
Titusville Iron Works Co. ..... 6 Beeville Lane
Vogt Machine Co., Henry ..... Booth 128, Oklahoma Bldg.


PUMPING PENDULUM
SC-20 PUMPING UNIT
WITH "V" ATTACHMENT
CHANNEL ROD REST
NO. 16 FLOOR BLOCK
TC-27C PUMPING UNIT
SHORT BASE
LOUNGE AND DISPLAY OF SUCKER RODS, DI-HARD LINERS AND MISC. MATERIAL
TC-20B PUMPING UNIT
EXTENDED BASE
NO 50 EEC TYPE GEARED POWER
NO 30 SC GEARED POWER
NO 80 SC GEARED POWER
NO 100 SC GEARED POWER
NO 80 SC GEARED POWER
6X12 TWIN HORIZONTAL PISTON VALVE STEAM ENGINE
FOSTER WHEELER SUPER-HEATER
BOILER FEED WATER UNIT
BRANTLY HYDRAULIC FEED CONTROL
WILSON-SNYDER NO 7-P POWER PUMP WITH NO 7 VERTICAL ENGINE
80" TRAVELING BLOCK
NO 7-P HOIST
NO 12-D VERTICAL STEAM ENGINE
SAND OR CORE BARREL REEL
NO. 10 PUMPING UNIT
NO 727 DRILLING UNIT WITH NO 150-A SWIVEL
NO 300 CROWN BLOCK
6X4 26A BOILER FEED PUMP
NO 18 WILSON-SNYDER STEAM SLUSH PUMP
SUPER-WILSON SNYDER PUMP

SEE ALL THIS . . . AND MORE

at the "OILWELL" display at the International Petroleum Exposition

We're tipping you off to what you'll see at the huge "OILWELL" Indoor and Outdoor Exhibit.

Look at this advance floor plan. See the full line of Steam Driven Rotary Machinery, Hoists, Swivels, Crown Blocks, and Traveling Blocks, together with modern Power Plant Equipment including Boiler Feed Pumps, Superheaters, and Feedwater Heaters; also Slush Pumps, Di-Hard Liners, etc.

See the Sucker Rod Display with the Sulphide Corrosion Testing Apparatus in operation; also Geared Powers, Individual Pumping Units, Jacks, etc.

You'll get a big welcome. We're always glad to see old friends and to make new ones.

Remember your trip to Tulsa will not be complete unless you see the "OILWELL" Machinery and Equipment.

EXHIBIT SPACE

3 DRAKE DRIVE

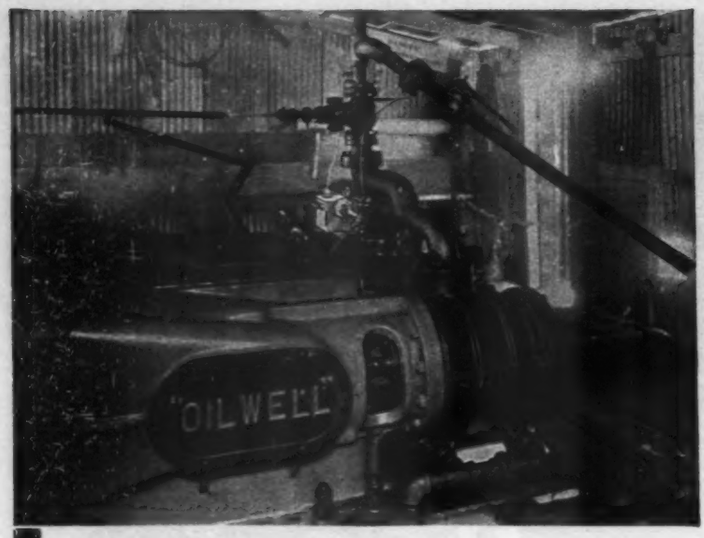
INTERNATIONAL PETROLEUM EXPOSITION

OIL WELL SUPPLY COMPANY

Subsidiary of United States Steel Corporation

Branch Stores in All Oil Fields

"OILWELL"



Showing a 3-feed "STANDARD" LUBRICATOR protecting an engine in the Oklahoma City field.

Every "STANDARD" User IS A LIVING ADVERTISEMENT

for this

DEPENDABLE LUBRICATOR

For your inspection "STANDARD" LUBRICATORS will be in operation on engines, pumps, and other oil country equipment in several exhibits at the Tulsa Exposition, May 16-23. Your careful study of them is invited. You'll have the opportunity to question many users. We hope you will. We get a lot of new customers that way. And our customers are saving a lot of money on lubrication costs.

Your Supply Dealer will be glad to tell you about "STANDARDS". He has a model to meet your lubrication needs.

American Lubricator Company

First National Bank Bldg., Dallas, Texas

Export: Oil Well Supply Company

BOOMS—PIPE LINE

Allsteel Products Mfg. Co. ..... 9 Arcade Way
Crutcher-Rolfs-Cummings, Inc. .. Booths 60-62, 43-45, California Bldg.
Muskogee Iron Works ..... 9 Skelly Drive
Trackson Co. ..... 8 Tyler St.
W-K-M Co., Inc. ..... Booths 60, 61, 62, 43, 44, 45, California Bldg.

BOTTOM-HOLE CHOKES

Otis Pressure Control Co. ..... Booth 35, Oklahoma Bldg.

BOXES—STUFFING

American Iron & Machine Works Co. .. Booths 51-52, Oklahoma Bldg.
Axelson Mfg. Co. ..... 1 Drake Drive
Baash-Ross Tool Co. ..... Booth 69, Texas Bldg.
Bradford Motor Works ..... 6 Drake Drive
Emsco Derrick & Equipment Co. ..... 2 Skelly Drive
Happy Belting Co. ..... Booths 1-2, Oklahoma Bldg.
Hercules Tool Co. ..... Booths 55-56, Texas Bldg.
Hough Mfg. Co., Chas. N. ..... Booths 123-124, Texas Bldg.
Oil Well Improvements Co. ..... Booths 94, 95, 116, Texas Bldg.
Ratigan, J. P. ..... 1 Drake Drive

BRAKES—POWER—FOR TRUCKS AND TRACTORS

Vacuum Power Equipment Co. ..... 12 Skelly Drive

BRAKES—SPECIAL ROTARY DRILLING

Carson Machine & Supply Co. ..... Booth 46, California Bldg.
Parkersburg Rig & Reel Co. .. Booths 74-75, Texas Bldg., 12 Drake Drive

BRIDGE PLUG

Baker Oil Tools, Inc. ..... Booths 99-112, Oklahoma Bldg.

BRINE TREATMENT

Dearborn Chemical Co. ..... Booth 105, Texas Bldg.

BROOMS AND BRUSHES

Osborn Mfg. Co. ..... Booth 5, Arcade

BUILDINGS—STEEL

International Derrick & Equipment Co. ..... 10 Drake Drive
Muskogee Iron Works ..... 9 Skelly Drive
Truscon Steel Co. ..... Booths 16-21, Texas Bldg.

BURNERS

Lucey Boiler & Mfg. Corp. ..... 8 Oil City Way
Natural Gas Equipment Co. ..... Booths 22-23, Oklahoma Bldg.
Sonner Burner Co. .... Booth 58, Oklahoma Bldg., 9 Oklahoma Drive
Surface Combustion Corp. ..... Booths 22-23, Oklahoma Bldg.
Webster Engineering Co. ..... Booths 22-23, Oklahoma Bldg.
W-K-M Co., Inc. ..... Booths 60, 61, 62, 43, 44, 45, California Bldg.
Zink, John ..... 13 Oklahoma Drive

CANS—OIL

American Can Co. ..... Booths 45-60, Refiners & Marketers Bldg.
Geuder, Paeschke & Frey Co. ..... Booth 6, Refiners & Marketers Bldg.

CANVAS PRODUCTS

Tulsa Canvas Products Co. .... Booth 17, Refiners & Marketers Bldg.

CARBIDE

National Carbide Sales Corp. ..... Booth 30, Oklahoma Bldg.

CARBON

National Carbon Co. ..... Booth 64, California Bldg.

CARBURETORS

Ensign Carburetor Co. ..... Booth 41, California Bldg.
Schuller, Inc., A. W. ..... Booth 41, California Bldg.
Waukesha Motor Co. ..... 6 Skelly Drive
Young Engine Corp. ..... 5 Texas Drive

CASING & TUBING

Atlas Supply Co. ..... 7 Arcade Way
Bovaird Supply Co. ..... Booths 25, 26, 27, Texas Bldg.
Bridgeport Machine Co. ..... 6 Drake Drive
Continental Supply Co. ..... 2 Drake Drive
Frick-Reid Supply Corp. ..... 1 Drake Drive
Hydril Co. ..... Booths A-B, Outside Texas Bldg.
International Supply Co. ..... 6 Beeville Lane
Jarecki Mfg. Co. ..... Booths 79-132, Texas Bldg.
Jones & Laughlin Steel Corp. .... Booths 12, 13, 14, 15, 16, Okla. Bldg.

Now High Oxidation Resistance at Low Cost with SILMO STILL TUBES

GOOD WILL BASED ON GOOD STEEL

Timken SILMO Steel Still Tubes provide oxidation resistance comparable with that of 4-6% chromium ½% molybdenum steels at much lower cost.

SILMO is the latest Timken development in high temperature steels. Its use is indicated wherever oxidation is the principal threat to tube life. SILMO Still Tubes stand up and give satisfactory service under oxidation conditions that render ordinary carbon steel tubes unsafe in a comparatively short time.

SILMO Tubes are not particularly recommended where high creep strength is a major service factor. For this condition Timken DM Tubes should be used, and will be found a decided economy.

However, SILMO Tubes possess from 2 to 3 times greater creep strength than ordinary carbon tubes at high temperatures and will give a good account of themselves in this respect.

If you have an oxidation problem you can solve it and save with SILMO.

THE TIMKEN STEEL & TUBE COMPANY, CANTON, OHIO

District Offices or Representation in the following cities: Detroit Chicago New York Los Angeles Boston Philadelphia Houston Buffalo Rochester Syracuse Tulsa Cleveland Erie Dallas Kansas City St. Louis Cincinnati Huntington Pittsburgh

World's Largest Producer of Electric Furnace Steel

TIMKEN STEEL TUBES

ELECTRIC FURNACE AND OPEN HEARTH • ALL STANDARD AND SPECIAL ANALYSES

CHECK THE ADVANTAGES of all 3 of these SELF-CHECKING WELL SURVEYING INSTRUMENTS

The Self Checking

H-K Clinograph

Records in *single readings*, accurately and automatically by photography, both the amount and the direction of inclination. Uses floating compass not subject to breakage; is self-checking and reliable. Used in *open holes only*. Lowered on a sand or bailing line at a speed ranging from 400 to 800 feet per minute. Records on paper discs are available within five minutes after removing instrument from hole. (U. S. Patents 1,812,994; 2,027,642, and others pending.)

The Self Checking

SURWEL Gyroscopic Clinograph

The most accurate and reliable method ever devised for making underground surveys of bore holes, providing a true map of the course of the well at all depths, prepared from actual photographic records. Not affected by *Tortuosity* nor by *Magnetic influence* nor *human errors* when recording. Self-checking, makes two surveys in one round trip, one going in and one coming out. Speedy operation, requires less rig time than any other instrument. (U. S. Patents 1,124,068; 1,812,994; 1,959,141; 1,960,038; 2,012,455; 2,012,456, and others pending.)

The Self Checking

SYFO Clinograph

Records accurately on paper directly readable, the vertical deviation of a bore hole without the use of dangerous acids. Is speedy, self-checking, simple to operate and inexpensive. Can be used on a wire line or as a "Go-Devil" running inside the drill stem or on sand or bailing line in open hole. (U. S. Patents 1,962,634; 2,013,875, and others pending.)

SPERRY-SUN WELL SURVEYING CO.

1608 Walnut Street, Philadelphia, Pa.

TULSA, OKLAHOMA
425 Petroleum Building

HOUSTON, TEXAS
3118 Blodgett Avenue

LONG BEACH, CALIF.
549 E. Bixby Rd., (3900 Block—Atlantic Ave.)

Lucey Products Corp. ..... 8 Oil City Way
Mid-Continent Supply Co. ..... Booths 43, 44, 45, 46, 47, Okla. Bldg.
Murray Tool & Supply Co. ..... Booths A-B, Outside Texas Bldg.
National Supply Co. ..... 5 Drake Drive
National Tube Co. ..... Booths 93 to 118, incl., Oklahoma Bldg.
Norvell-Wilder Supply Co. ..... 3 Skelly Drive
Oil Well Supply Co. ..... 3 Drake Drive
Pittsburgh Steel Co. ..... Booths 4, 5, 6, Texas Bldg.
Republic Steel Corp. ..... Booths 16, 17, 18, 19, 20, 21, Texas Bldg.
Republic Supply Co. ..... Booths 16, 17, 18, 19, 20, 21, Texas Bldg.
Scovill Mfg. Co. ..... Booth 127, Oklahoma Bldg.
Smith Corp., A. O. ..... Booths 87-88, Oklahoma Bldg.
Spang, Chalfant & Co. ..... Booths 44-45, Texas Bldg.
Timken Steel & Tube Co. ... Booths 10-12, Refiners & Marketers Bldg.
Youngstown Sheet & Tube Co. ..... 2 Drake Drive

CASING JOINT

Hydril Co. ..... Booths A-B, Outside Texas Bldg.

CASING PACKER PLUG

Hydril Co. ..... Booths A-B, Outside Texas Bldg.

CASTINGS

Allis-Chalmers Mfg. Co. ..... 2 Oil City Way, 15 Arcade Way
Chain Belt Co. ..... Booths 70-71, Texas Bldg.
Crane Co. ..... Booths 50-55, Refiners & Marketers Bldg.
Interstate Drop Forge Co. ..... Booths 70-71, Texas Bldg.
Link-Belt Co. ..... Booths 61, 62, 63, Texas Bldg.
Oklahoma Steel Casting Co. ..... Booths 47-48, Texas Bldg.
Parkersburg Rig & Reel Co. . Booths 74-75, Texas Bldg., 12 Drake Drive
Progressive Brass Mfg. Co. ..... Booth 11, Texas Bldg.
Rogers Iron Works ..... Booth 13, Refiners & Marketers Bldg.
St. Louis Steel Casting Co. ..... Booth 36, California Bldg.
Shaffer Co., J. E. ..... 2 West Virginia Ave.
Sivyer Steel Co. ..... Booths 70-71, Texas Bldg.
Western Iron & Foundry Co. ..... Booth 17, California Bldg.
Wheatley Bros. Pump & Valve Mfg. Co. ..... 5 Signal Hill St.

CATHEADS

Allsteel Products Mfg. Co. ..... 9 Arcade Way
American Iron & Machine Works Co. . Booths 51-52, Oklahoma Bldg.
Baash-Ross Tool Co. ..... Booth 69, Texas Bldg.
Emsco Derrick & Equipment Co. ..... 2 Drake Drive
Lucey Products Corp. ..... 8 Oil City Way
MacClatchie Mfg. Co. ..... 2 Drake Drive
National Supply Co. ..... 5 Drake Drive

CEMENT

Universal Atlas Cement Co. ..... Booths 93 to 118, incl., Okla. Bldg.

CEMENTING EQUIPMENT

Baker Oil Tools, Inc. ..... Booths 99-112, Oklahoma Bldg.
Halliburton Oil Well Cementing Co. ..... 5 Arcade Way
Larkin Packer Co. ..... Booths 80-81, Oklahoma Bldg.

CHAINS & SPROCKETS

Baldwin-Duckworth Chain Co. ..... Booths 9-10, Texas Bldg.
Bridgeport Machine Co. ..... 6 Drake Drive
Buda Engine Service of Tulsa ..... 17 Skelly Drive
Chain Belt Co. ..... Booths 70-71, Texas Bldg.
Diamond Chain & Mfg. Co. .... Booth 31, Scientific & Technical Bldg.
Emsco Derrick & Equipment Co. ..... 2 Drake Drive
Fix Co., Geo. J. ..... Booths 9-10, Texas Bldg.
Hanlon-Waters, Inc. ..... Booths 83-128, Texas Bldg.
Link-Belt Co. ..... Booths 61, 62, 63, Texas Bldg.
Lucey Products Corp. ..... 8 Oil City Way
Morse Chain Co. ..... Booth 54, California Bldg.
O.C.S. Mfg. Co. ..... Booths 10-11, Oklahoma Bldg., 1 Skelly Drive
Parkersburg Rig & Reel Co. . Booths 74-75, Texas Bldg., 12 Drake Drive
Portable Rig Co. ..... 3 West Virginia Ave
Shaffer Specialty Co. ..... 7 Oklahoma Drive
Union Chain & Mfg. Co. ..... Booths 4-5, California Bldg.
Wilson Mfg. Co. ..... 8 Oklahoma City Ave.

Wherever OIL is piped . . .

"DRESSERS"

SAVE YOU MONEY!

MISCELLANEOUS USES IN PRODUCTION
CHRISTMAS-TREE AND OTHER HOOK-UPS AT THE WELL
FLOW LINES TO AND FROM SEPARATORS
GATHERING, FIELD-STORAGE, AND TANK-BATTERY LINES
FIELD PUMPING STATION LINES TO MAIN LINE STATION
MAIN OR TRANSMISSION LINES TO REFINERIES
MANY TYPES OF LINES IN REFINERIES AND NATURAL-GASOLINE PLANTS
Dresser Steel Coupling, Style 38, 12" I.D.
Dresser Long Sleeve, Style 40, 8" I.D.
Dresser Service Coupling, Style 38, 1¼" I.D.
* Dresser Compression Coupling, Style 65, 2" I.D.

There are scores of applications where "Dressers" save you time, trouble, and money—because they make tight connections so quickly.

For example, a few hours saved in making connections at a new well may result in hundreds of dollars additional earnings.

All along the line—from well to market—there is a type and size of Dresser Coupling or Dresser Sleeve to fit every joining job—giving you the advantages of *permanent tightness, flexibility, simplicity, strength,* and *TRUE* economy.

*** Write for Folder No. 361, describing the new Dresser Compression Fittings.**

S. R. DRESSER MFG. COMPANY, BRADFORD, PA. *In Canada:* Dresser Mfg. Company Ltd., 32 Front Street West, Toronto, Ontario

Study these advantages of Reading-Pratt & Cady Lubrotite Valves . . .

. . . they lower valve costs!

● The illustrations above and the advantages listed at the right set forth the features of this efficient valve.

Reading-Pratt & Cady Lubrotite Gate Valves incorporate the fundamental principle of continuous tight sealing. This principle is available in any Pratt & Cady Iron Body Gate Valve or in any Reading-Pratt & Cady Electric Steel Gate Valve. It is suitable for a wide variety of services. Full and detailed descriptions will be found in booklet DH 665 which will be sent upon request.

ADVANTAGES

●

1. Positive Seal
2. Seals Injured Seats
3. Retards Galling
4. Retards Corrosion
5. Easier to Operate
6. Flushes Seating Surfaces
7. Prevents Sticking
8. Frees Set Wedge
9. Protects Seating Surfaces
10. Overcomes Necessity of Double Valve Installations
11. Dependable in Emergencies
12. Permits Steaming Out Lines
13. Standard Iron and Steel—for all purposes
14. A Lubricant-Seal for various Types of Services
15. Easy to Lubricate
16. Lubricant Furnished in Convenient Pocket Sized Packages

Reading-Pratt & Cady Valves will be on Exhibit in Booth 85, Petroleum Exposition

READING-PRATT & CADY CO., INC.
An Associate Company of the American Chain Company, Inc.
Bridgeport, Connecticut
In Business For Your Safety

READING-PRATT & CADY VALVES

CHAINS—TIRE

American Chain Co. ..... Booth 4, Oklahoma Bldg.
Pyrene Mfg. Co. ..... Booths 38-39, Oklahoma Bldg.

CHEMICAL SERVICE—OIL & GAS WELL

Dowell, Inc. ..... Booths 28-29, California Bldg.

CLAMPS—PIPE

Baash-Ross Tool Co. ..... Booth 69, Texas Bldg.
Beaumont Iron Works Co. ..... 1 Drake Drive
Crane Co. ..... Booths 50-55, Refiners & Marketers Bldg.
Gaso Pump & Burner Mfg. Co. ..... Booths 57-58, Texas Bldg.
Hughes Tool Co. ..... Booths 91-93, Texas Bldg.
International Derrick & Equipment Co. ..... 10 Drake Drive
Miller Sand Pump Co. ..... 10 Oil City Way
Walworth Co. ..... Booths 104-107, Oklahoma Bldg.

CLAMPS—POLISHED ROD

American Iron & Machine Works Co. . . Booths 51-52, Oklahoma Bldg.
Axelson Mfg. Co. ..... 1 Drake Drive
Bradford Motor Works ..... 6 Drake Drive
Emsco Derrick & Equipment Co. ..... 2 Drake Drive
Hough Mfg. Co., Chas. N. ..... Booths 123-124, Texas Bldg.
International Derrick & Equipment Co. ..... 10 Drake Drive
Muskogee Iron Works ..... 9 Skelly Drive
O'Bannon Co., Walter ..... Booth 104, Texas Bldg.
Ratigan, J. P. ..... 1 Drake Drive

CLEANING MATERIALS

Dearborn Chemical Co. ..... Booth 105, Texas Bldg.
Oakite Products, Inc. ..... Booths 10-11, California Bldg.

CLUTCHES

Allis-Chalmers Mfg. Co. ..... 2 Oil City Way, 15 Arcade Way
Beaumont Iron Works Co. ..... 1 Drake Drive
Buffalo Gasolene Motor Co. ..... Booths 51-55, California Bldg.
Cooper-Bessemer Corp. ..... 8 Skelly Drive
Dodge Mfg. Co. ..... Booths 4-5, California Bldg.
Happy Belting Co. ..... Booths 1-2, Oklahoma Bldg.
International Derrick & Equipment Co. ..... 10 Drake Drive
Link-Belt Co. ..... Booths 61-63, Texas Bldg.
Lucey Products Corp. ..... 8 Oil City Way
Oil Country Specialties Mfg. Co. . Booths 10-11, Okla., 1 Skelly Drive
Portable Rig Co. ..... 3 West Virginia Ave.
Reid Gas Engine Co., Jos. ..... 1 Drake Drive
Shaffer Specialty Co. ..... 7 Oklahoma Drive
Twin Disc Clutch Co. ..... Booths 79-132, Oklahoma Bldg.
Weber Engine Co. ..... 7 Arcade Way
Young Engine Corp. ..... 5 Texas Drive

CO. RECORDERS

Carrick Engineering Co. .... Booths 8-9, Scientific & Technical Bldg.
Leeds & Northrup Co. ..... Booths 29-30, Scientific & Technical Bldg.

COATINGS—PIPE LINE

Atlas Supply Co. ..... 7 Arcade Way
Dearborn Chemical Co. ..... Booth 105, Texas Bldg.
General Paint Corp. ..... Booths 38-39, Texas Bldg.
Hill, Hubbell & Co. ..... Booths 38-39, Texas Bldg.
Sherwin-Williams Co. ..... Booths 53-54, Oklahoma Bldg.
Tnemec Co., Inc. ..... 7 Arcade Way

COLLARS—DRILL

American Iron & Machine Works Co. . . Booths 51-52, Oklahoma Bldg.
Baash-Ross Tool Co. ..... Booth 69, Texas Bldg.
Beaumont Iron Works Co. ..... 1 Drake Drive
Bridgeport Machine Co. ..... 6 Drake Drive
Byron Jackson Co. ..... Booths 25-28, Oklahoma Bldg.
Emsco Derrick & Equipment Co. ..... 2 Drake Drive
Hinderliter Tool Co. ..... Booths 22, 23, 24, Texas Bldg.
Hughes Tool Co. ..... Booths 91-93, Texas Bldg.
Hydril Co. ..... Booths A-B, Outside Texas Bldg.
International Derrick & Equipment Co. ..... 10 Drake Drive
Lucey Products Co. ..... 8 Oil City Way
Reed Roller Bit Co. ..... Booths 12, 13, 14, Texas Bldg.
Titusville Iron Works Co. ..... 6 Beeville Lane

INTRODUCING

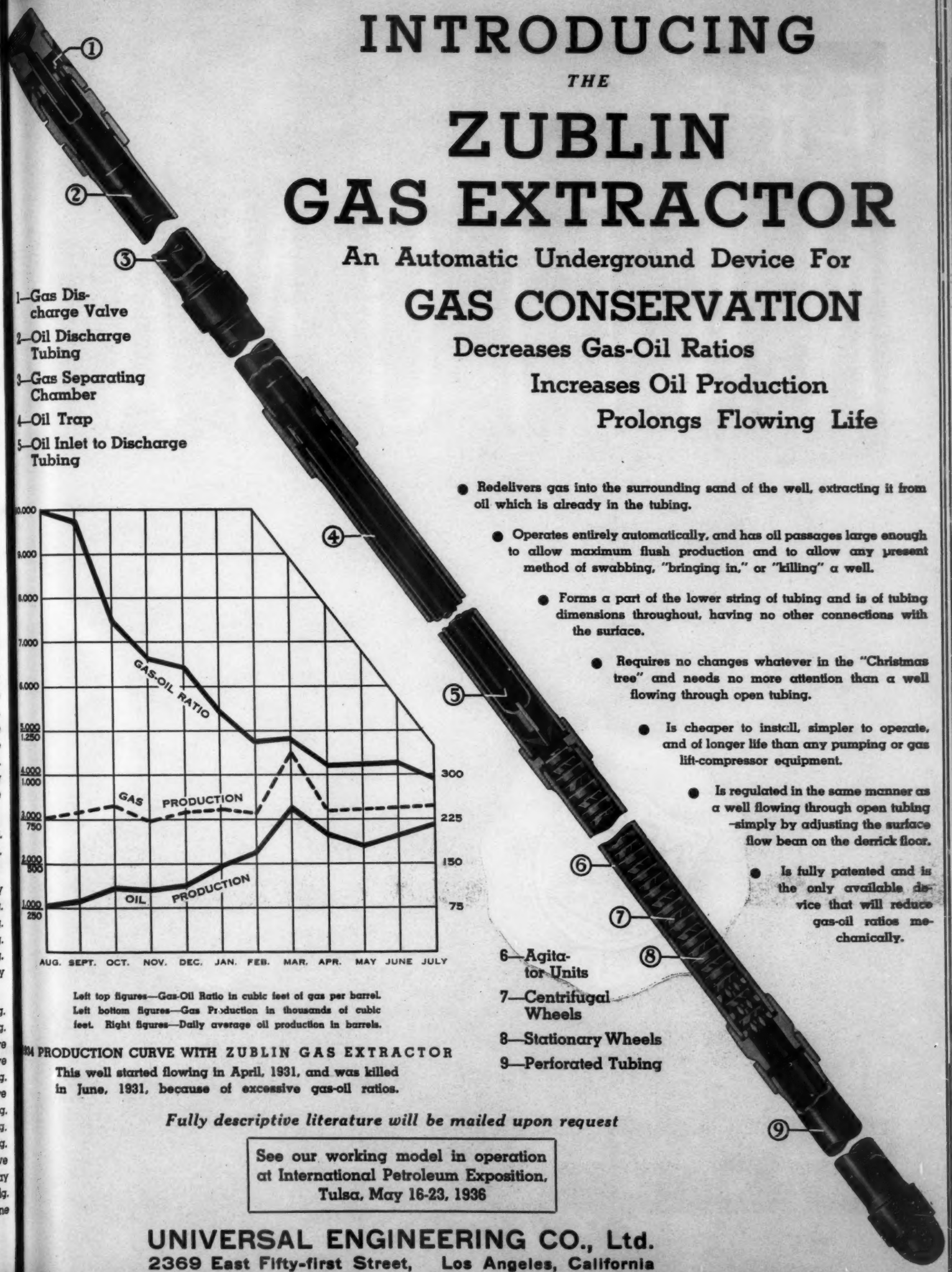
THE

ZUBLIN GAS EXTRACTOR

An Automatic Underground Device For

GAS CONSERVATION

Decreases Gas-Oil Ratios
Increases Oil Production
Prolongs Flowing Life



Left top figures—Gas-Oil Ratio in cubic feet of gas per barrel. Left bottom figures—Gas Production in thousands of cubic feet. Right figures—Daily average oil production in barrels.

PRODUCTION CURVE WITH ZUBLIN GAS EXTRACTOR
This well started flowing in April, 1931, and was killed in June, 1931, because of excessive gas-oil ratios.

- Redelivers gas into the surrounding sand of the well, extracting it from oil which is already in the tubing.
- Operates entirely automatically, and has oil passages large enough to allow maximum flush production and to allow any present method of swabbing, "bringing in," or "killing" a well.
- Forms a part of the lower string of tubing and is of tubing dimensions throughout, having no other connections with the surface.
- Requires no changes whatever in the "Christmas tree" and needs no more attention than a well flowing through open tubing.
- Is cheaper to install, simpler to operate, and of longer life than any pumping or gas lift-compressor equipment.
- Is regulated in the same manner as a well flowing through open tubing—simply by adjusting the surface flow bean on the derrick floor.
- Is fully patented and is the only available device that will reduce gas-oil ratios mechanically.

Fully descriptive literature will be mailed upon request

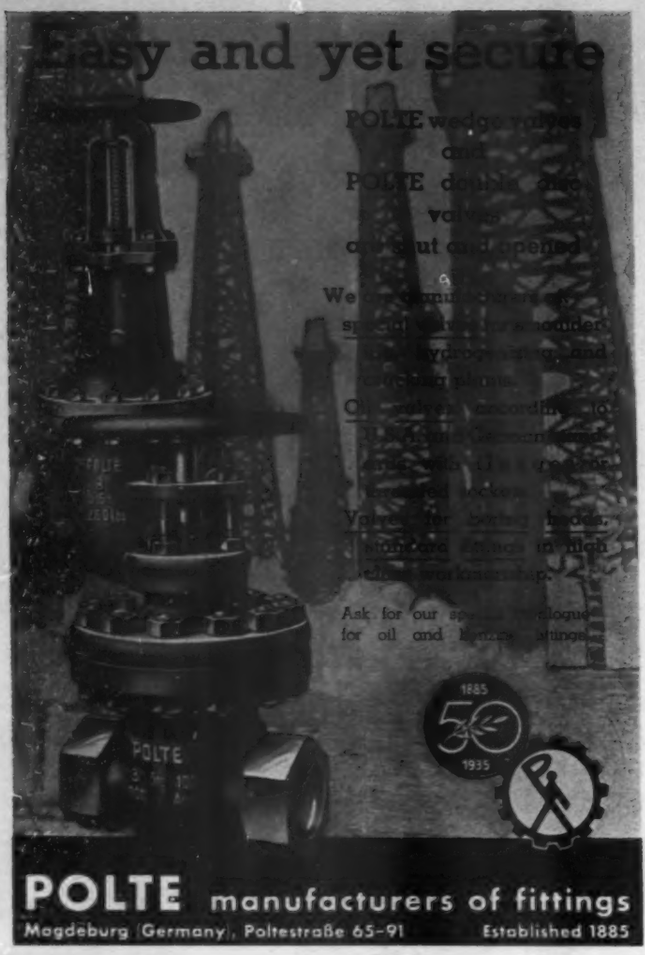
See our working model in operation at International Petroleum Exposition, Tulsa, May 16-23, 1936

UNIVERSAL ENGINEERING CO., Ltd.
2369 East Fifty-first Street, Los Angeles, California

THE NATIONAL

SUPPLY *Exhibit*

. . . covers an area of 9480 square feet the largest display of modern oil field equipment at the Tulsa Exposition



See our Display, featuring

OTIS SQUARE KELLY DRILLING HEAD

for use in

DRILLING UNDER PRESSURE

with

SQUARE KELLY

and

ORDINARY OUTSIDE COUPLED DRILL STEM

•

BOOTH 35 — OKLAHOMA BUILDING

9TH INTERNATIONAL PETROLEUM EXPOSITION

Tulsa, Oklahoma, May 16 to 23, 1936

•

OTIS PRESSURE CONTROL, INC.

Tower Petroleum Bldg. . . . . Dallas, Texas

Houston, Texas — Wellsville, N. Y. — Midland, Texas
Hobbs, New Mexico — Oklahoma City, Okla. — Ada, Oklahoma

COMPOUNDS—BOILER

American Sand-Banum Co. ..... Booth 101, Texas Bldg.
Dearborn Chemical Co. ..... Booth 105, Texas Bldg.
Western Sand-Banum Co. ..... Booth 101, Texas Bldg.

COMPOUNDS—PETROLEUM TREATING

Dehydro Co. ..... 7 California Drive
Parasol Co., The ..... 7 California Drive

COMPRESSORS—AIR & GAS

Allis-Chalmers Mfg. Co. ..... 2 Oil City Way, 15 Arcade Way
Clark Bros. Co. ..... 3 Oklahoma Drive
Cooper-Bessemer Corp. ..... 8 Skelly Drive
Gardner-Denver Co. ..... 2 Drake Drive
General Electric Co. ..... 2 Drake Drive
Ingersoll-Rand Co. ..... 2 Tyler St.
Leland Equipment Co. ..... 12 Skelly Drive
Moorlane Co. ..... Booth 83, Oklahoma Bldg.
National Transit Pump & Machine Co. ..... 1 Drake Drive
Reid Gas Engine Co., Jos. ..... 1 Drake Drive
Sterling Machinery Corp. ..... 12 Skelly Drive
Sullivan Machinery Co. ..... 3 Beeville Lane
Worthington Pump & Machinery Corp. ..... 4 Skelly Drive
Young Engine Corp. ..... 5 Texas Drive

CONCRETE MIXERS

Koehring Co. ..... 12 Skelly Drive
Leland Equipment Co. ..... 12 Skelly Drive

CONDENSERS

Allis-Chalmers Mfg. Co. ..... 2 Oil City Way, 15 Arcade Way
Elliott Co. ..... Booth 111, Oklahoma Bldg.
General Electric Co. ..... 2 Drake Drive
Ingersoll-Rand ..... 2 Tyler St.
National Radiator Corp. ..... Booths 12-13, California Bldg.
Scovill Mfg. Co. ..... Booth 127, Oklahoma Bldg.
Soph, Edward ..... Booths 1, 12, 13, California Bldg.
Titusville Iron Works Co. ..... 6 Beeville Lane
Vinson Supply Co. ..... Booth 133, Texas Bldg.
Worthington Pump & Machinery Corp. ..... 4 Skelly Drive

CONTAINERS—SHIPPING

Gaylord, Inc., Robt. ..... Booth 20, Oklahoma Bldg.
New Orleans Corrugated Box Co. ..... Booth 20, Oklahoma Bldg.
Southern Container Corp. ..... Booth 20, Oklahoma Bldg.
South West Box Co. ..... Booth 18, Refiners & Marketers Bldg.
Texas Corrugated Box Co. ..... Booth 20, Oklahoma Bldg.

CONTROL EQUIPMENT—PRESSURE & LIQUID LEVEL

American Meter Co. ..... Booths 41-43, Scientific & Technical Bldg.
Bailey Meter Co. ..... Booth 34, Scientific & Technical Bldg.
Black, Sivalls & Bryson, Inc. ..... Booths 39-66, California Bldg.
Bristol Co. ..... Booths 1-2, Scientific & Technical Bldg.
Brown Instrument Co. ..... Booths 39-64, Scientific & Technical Bldg.
Chaplin-Fulton Mfg. Co. ..... Booth 40, Scientific & Technical Bldg.
Consolidated Ashcroft Hancock Co. ..... Booths 8-9, Scien. & Tech. Bldg.
Fisher Governor Co. ..... Booth 89, Texas Bldg.
Foxboro Co. ..... Booths 4-6, Scientific & Technical Bldg.
Hanlon-Waters, Inc. ..... Booths 83-128, Texas Bldg.
Leeds & Northrup Co. ..... Booths 29-30, Scientific & Technical Bldg.
Mason-Neilan Regulator Co. ..... Booths 14-15, Arcade
Metric Metal Works ..... Booths 41-43, Scientific & Technical Bldg.
Minneapolis-Honeywell Reg. Co. ..... Booths 39-64, Scien. & Tech. Bldg.
Moorlane Co. ..... Booth 83, Oklahoma Bldg.
National Tank Co. ..... Booths 96-115, Texas Bldg.; 9 Oil City Way
Smith Separator Co. ..... Booths 90-122, Texas Bldg.
Tagliabue Mfg. Co., C. J. ..... Booths 32-33, Scien. & Tech. Bldg.
Taylor Instrument Companies ..... Booths 35-36, Scien. & Tech. Bldg.
Vogt Machine Co., Henry ..... Booth 128, Oklahoma Bldg.
Webster Engineering Co. ..... Booths 22-23, Oklahoma Bldg.
Westinghouse Electric & Mfg. Co. ..... Booths 91-120, Oklahoma Bldg.
Westcott & Greis, Inc. ..... Booths 41, 42, 43, Scientific & Technical Bldg.

CONTROLS—AUTOMATIC VALVE

Automatic Valve Controller Co. ..... 12 Oil City Way

PRODUCTION

TRANSPORTATION

REFINING • • • AND MARKETING

FINANCING

The Oil Bank of America

OIL Industry's headquarters are here in Tulsa, making it the OIL CAPITAL OF THE WORLD.

And here, too, is the OIL BANK OF AMERICA, putting the strength of its financial resources behind every branch of the industry. Individuals and corporations appreciate what this title signifies and daily make use of its service features and the seasoned advice of its officers.

You'll find that the Oil Industry always turns to the National Bank of Tulsa because its outstanding co-operation makes it the OIL BANK OF AMERICA.

NATIONAL BANK OF TULSA

TULSA, OKLAHOMA

MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

for a list of Satisfied Users of this

SHEAR-RELIEF VALVE

Just take the

WHOLE FIELD—

and you won't miss it far!

It doesn't take long for any mechanically minded man to see that the working principle of the SHEAR-RELIEF Valve is right. And the field doesn't take long finding that it's practical . . . that it works every time . . . that the nail never fails to shear at the set point to save a blowup of pump parts.

And it doesn't take long for the man who pays the bills to see that it's cutting pump maintenance costs to a minimum.

That's why, in less than three years on the market, it's the most popular relief valve. Check for yourself. You'll see them protecting pumps wherever you go in the oil country!

Read Page 71, Your 1936 Composite Catalog

FLUID-PISTON FLUSH PUMPS
ABERCROMBIE PUMP CO.
GULF BLDG. HOUSTON TEX.

CF

FULTON
Cut-Out Latch
Regulator

If Gas Fails the Regulator will close and lock

THERE are no hazards due to failure of gas supply where the Fulton Cut-Out Latch Regulator is installed. Let pressure drop below the set minimum and the latch automatically shuts and locks the valve. Before flow will resume, the operator must open the valve by hand. Users of low-pressure furnaces and burners protect their equipment effectively, at little cost, by adoption of this safeguard. Catalog on request.

Dependable C-F Regulators for all requirements of pressure control are used in widely varied branches of industry. Catalog on request.

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Big Four Foundry Co., Inc. ..... 2 West Virginia Ave.
Bovaird Supply Co. ..... Booths 25-27, Texas Bldg.
Bridgeport Machine Co. ..... 6 Drake Drive
Frick-Reid Supply Corp. ..... 1 Drake Drive
International Derrick & Equipment Co. ..... 10 Drake Drive
Lufkin Foundry & Machine Co. ..... 15 Skelly Drive
National Supply Co. ..... 5 Drake Drive
Oil Well Supply Co. ..... 3 Drake Drive
Oil Country Specialties Mfg. Co. . Booths 10-11, Okla., 1 Skelly Drive
Parkersburg Rig & Reel Co. . Booths 74-75, Texas Bldg., 12 Drake Drive
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International Derrick & Equipment Co. ..... 10 Drake Drive
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Western Iron & Foundry Co. ..... Booth 17, California Bldg.
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Foote Bros. Gear & Machine Co. ..... Booth 55, California Bldg.
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Happy Belting Co. ..... Booths 1-2, Oklahoma Bldg.
International Derrick & Equipment Co. ..... 10 Drake Drive
Link-Belt Co. ..... Booths 61-63, Texas Bldg.
Morse Chain Co. ..... Booth 54, California Bldg.
Union Chain & Mfg. Co. ..... Booths 4-5, California Bldg.

COUPLINGS—HOSE

American Iron & Machine Works Co. . Booths 51-52, Oklahoma Bldg.
Bridgeport Machine Co. ..... 6 Drake Drive
Gustin-Bacon Mfg. Co. ..... Booths 52, 53, 54, Texas Bldg.
Lucey Products Corp. ..... 8 Oil City Way
Shaffer Specialty Co. ..... 7 Oklahoma Drive

COUPLINGS—PIPE

American Iron & Machine Works Co. . Booths 51-52, Oklahoma Bldg.
Champion Machine & Forging Co. ..... 2 Drake Drive
Crane Co. ..... Booths 50-55, Refiners & Marketers Bldg.
Foote Bros. Gear & Machine Co. ..... Booth 55, California Bldg.
Gustin-Bacon Mfg. Co. ..... Booths 52, 53, 54, Texas Bldg.
Hanlon-Waters, Inc. ..... Booths 43, 83, 84, 127, 128, Texas Bldg.
Jones & Laughlin Steel Corp. ..... Booths 12-16, Oklahoma Bldg.
Lucey Products Corp. ..... 8 Oil City Way
National Tank Co. ..... Booths 96-115, Texas Bldg., 9 Oil City Way
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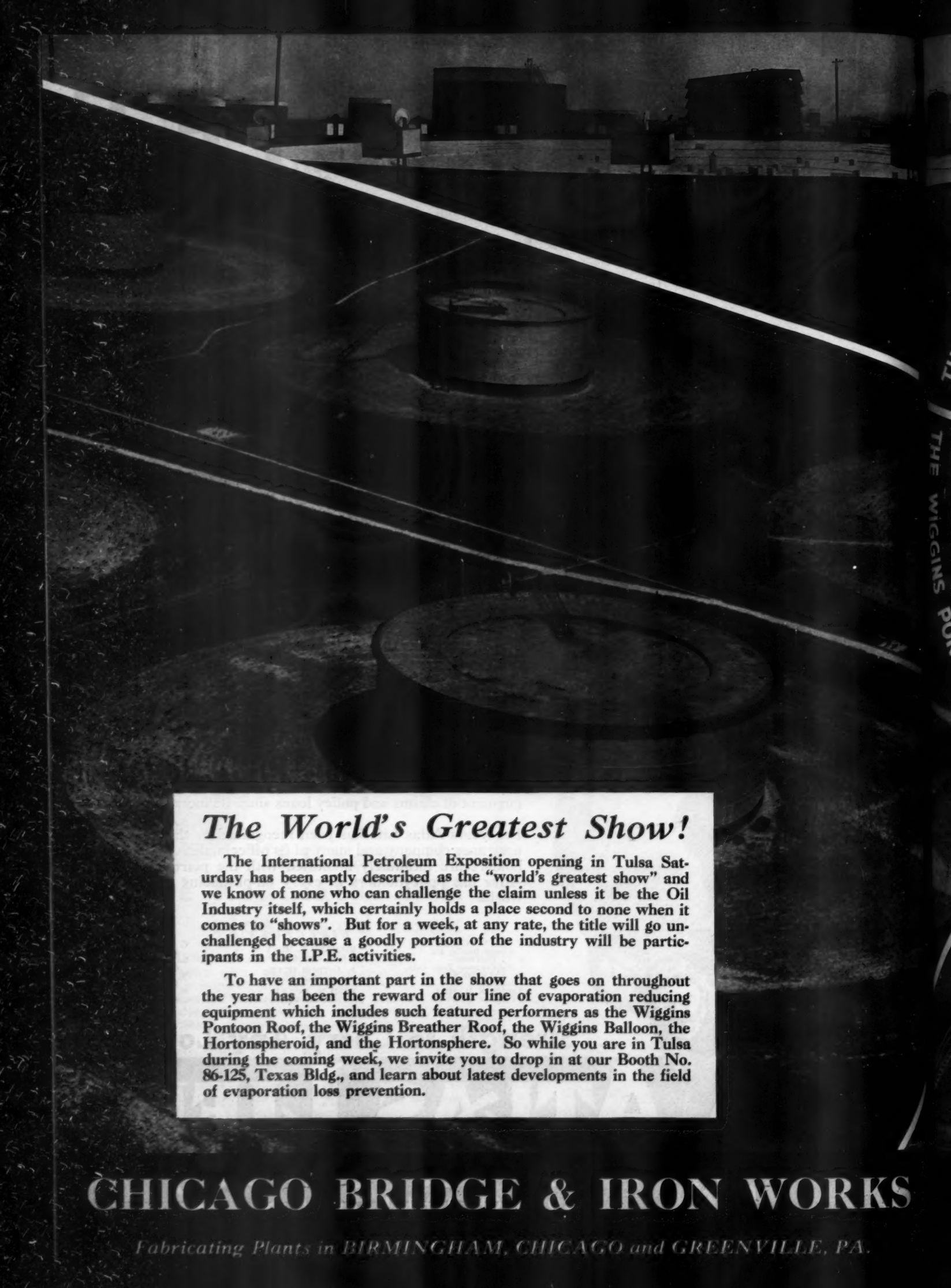

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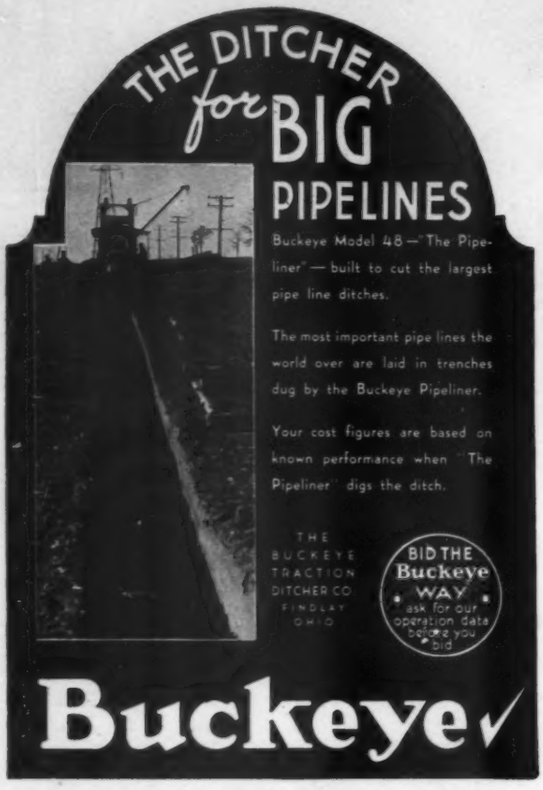
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Continental Supply Co. ..... 2 Drake Drive
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International Derrick & Equipment Co. ..... 10 Drake Drive
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Lucey Products Corp. ..... 8 Oil City Way
Lufkin Foundry & Machine Co. ..... 15 Skelly Drive
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Norvell-Wilder Supply Co. ..... 3 Skelly Drive
Oil Country Specialties Mfg. Co. . Booths 10-11, Okla., 1 Skelly Drive
Oil Well Supply Co. ..... 3 Drake Drive
Oklahoma Iron Works ..... 6 Beeville Lane
Republic Supply Co. ..... Booths 16-21, Texas Bldg.
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American Steel Derrick Co. ..... 8 Drake Drive
Bucyrus-Erie Co. ..... 2 Texas Drive
Failing Supply Co., Geo. E. ..... 5 Oil City Way
Franks Mfg. Co. ..... 3 Arcade Way
International Derrick & Equipment Co. ..... 10 Drake Drive
Keystone Driller Co. ..... 11 Oil City Way
Lucey Products Corp. ..... 8 Oil City Way
Moore & Co., Lee C. ..... Booths 65-66, Oklahoma Bldg.
Oil Country Specialties Mfg. Co. ..... Booths 10-11, Oklahoma Bldg.
Portable Rig Co. ..... 3 West Virginia Ave., 1 Skelly Drive
Shaffer Specialty Co. ..... 7 Oklahoma Drive
Star Drilling Machine Co. .. Booths 48-49, Refiners & Marketers Bldg.
Sullivan Machinery Co. ..... 3 Beeville Lane
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Failing Supply Co., Geo. E.	5 Oil City Way
Hughes Tool Co.	Booths 91-93, Texas Bldg.
Hydril Co.	Booths A-B, Outside Texas Bldg.
Ingersoll-Rand Co.	2 Tyler St.
Portable Rig Co.	3 West Virginia Ave.
Reed Roller Bit Co.	Booths 12, 13, 14, Texas Bldg.
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Sullivan Machinery Co.	3 Beeville Lane

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Reed Roller Bit Co.	Booths 12-14, Texas Bldg.
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EDUCATIONAL

Grolier Society, The	Booth 35, California Bldg.
Hemphill Diesel Schools	Booth 7, Scientific & Technical Bldg.
Oklahoma Pet. Industries Committee	Booths 17, 18, 19, Scien. & Tech.
Petroleum Electric Power Club	Booths 35-36, Ref. & Mark. Bldg.
Spartan School of Aeronautics	Booths 46-59, Ref. & Mark. Bldg.

ELECTRICAL EQUIPMENT

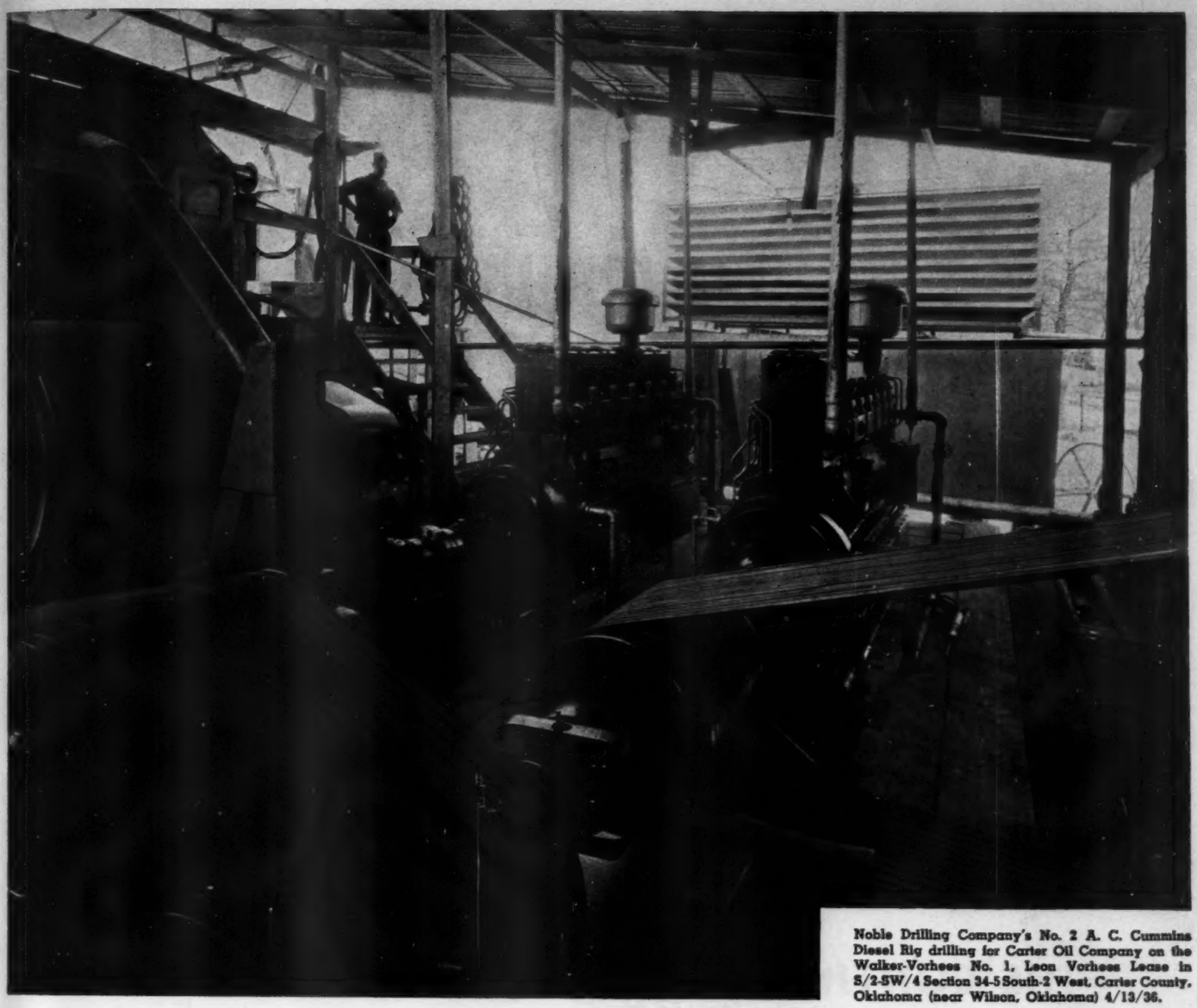
Adam Electric Co., Frank	Booth 64, California Bldg.
Allis-Chalmers Mfg. Co.	2 Oil City Way
Appleton Electric Co.	Booths 63-64, Refiners & Marketers Bldg.
Arrow Electric Co.	Booth 64, California Bldg.
Benjamin Electric Co.	Booths 23-24, Refiners & Marketers Bldg.
Bridgeport Machine Co.	6 Drake Drive
Bussman Mfg. Co.	Booth 64, California Bldg.
Crouse-Hinds Co.	Booths 56-57, Oklahoma Bldg.
Electric Supply Co.	Booth 64, California Bldg.
General Electric Co.	2 Drake Drive, Continental Supply Exhibits
Goodrich Electric Co.	Booth 41-42, Refiners & Marketers Bldg.
Harven Hubbell Co.	Booth 64, California Bldg.
Hazard Insulated Wire Co.	Booth 64, California Bldg.
Ideal Electric & Mfg. Co.	Booth 55, California Bldg.
Kuhlman Electric Co.	Booth 64, California Bldg.
Wagner Electric Co.	Booth 55, Oklahoma Bldg.
Westinghouse Electric & Mfg. Co.	Booths 91, 92, 119, 120, Okla. Bldg.

ELEVATORS—SUCKER ROD

Axelson Mfg. Co.	1 Drake Drive
Byron Jackson Co.	Booths 25-28, Oklahoma Bldg.
Carson Machine & Supply Co.	Booth 46, California Bldg.
Emsco Derrick & Equipment Co.	2 Drake Drive
Guiberson Corp.	Booths 106-107, Texas Bldg.
Ratigan, J. P.	1 Drake Drive

ENGINES—DIESEL

Allis-Chalmers Mfg. Co.	2 Oil City Way; 15 Arcade Way
Buda Co., The	3 Texas Drive
Buda Engine Service of Tulsa	17 Skelly Drive
Caterpillar Tractor Co.	10 Skelly Drive
Clark Bros. Co.	3 Oklahoma Drive
Cooper-Bessemer Corp.	8 Skelly Drive
Cummins Engine Co.	Booths 43-47, Oklahoma Bldg.; 12 Oil City Way
Emsco Derrick & Equipment Co.	2 Drake Drive
Fairbanks, Morse & Co.	2 Drake Drive
Guiberson Diesel Engine Co.	Booths 106-107, Texas Bldg
Hercules Motors Corp.	Booths 76, 77, 78, 133, 134, 135, Okla. Bldg.
Ingersoll-Rand Co.	2 Tyler St.
International Harvester Co.	3 Arcade Way
Mid-Continent Supply Co.	Booths 43, 44, 45, 46, 47, Oklahoma Bldg.
National Supply Co.	5 Drake Drive
Portable Rig Co.	3 West Virginia Ave.
Reid Gas Engine Co., Jos.	1 Drake Drive



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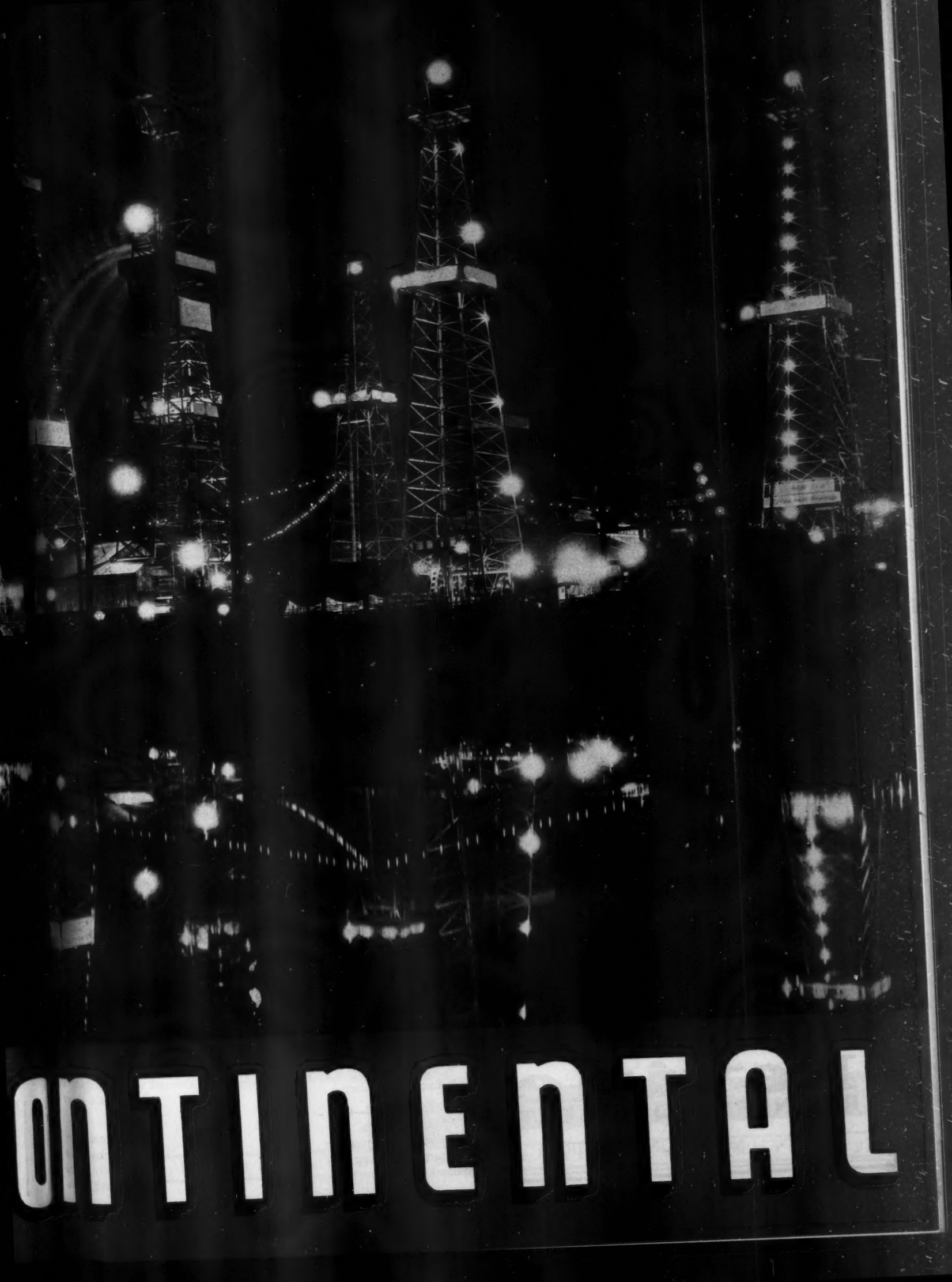
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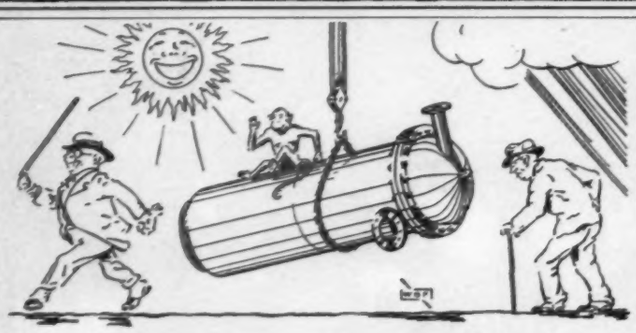

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Sterling Engine Co.	Booths A-B, Outside Texas Bldg.
Stover Mfg. & Engine Co.	Booths 43-47, Oklahoma Bldg.
Titusville Iron Works Co.	6 Beeville Lane
Waukesha Motor Co.	6 Skelly Drive
Weber Engine Co.	7 Arcade Way
Wilson Mfg. Co.	8 Oklahoma City Ave.
Worthington Pump & Machinery Corp.	4 Skelly Drive
Young Engine Corp.	5 Texas Drive

ENGINES—GAS

Atlas Supply Co.	7 Arcade Way
Bovaird Supply Co.	Booths 25-27, Texas Bldg.
Bridgeport Machine Co.	6 Drake Drive
Buda Co., The	3 Texas Drive
Buda Engine Service of Tulsa	17 Skelly Drive
Buffalo Gasolene Motor Co.	Booths 51-55, California Bldg.
Clark Bros. Co.	3 Oklahoma Drive
Climax Engineering Co.	2 Drake Drive
Continental Supply Co.	2 Drake Drive
Cooper-Bessemer Corp.	8 Skelly Drive
Cooper, Fred E.	15 Arcade Way
Fairbanks, Morse & Co.	2 Drake Drive
Falk Corp.	2 Drake Drive
Frick-Reid Supply Corp.	1 Drake Drive
Hercules Motors Corp.	Booths 76, 77, 78, 133, 134, 135, Okla. Bldg.
Ingersoll-Rand Co.	2 Tyler St.
International Derrick & Equipment Co.	10 Drake Drive
International Harvester Co.	3 Arcade Way
Lucey Products Corp.	8 Oil City Way
National Supply Co.	5 Drake Drive
National Transit Pump & Machine Co.	1 Drake Drive
Norvell-Wilder Supply Co.	3 Skelly Drive
Novo Engine Co.	5 Drake Drive
Oil Well Supply Co.	3 Drake Drive
Reid Gas Engine Co., Jos.	1 Drake Drive
Sterling Engine Co.	Booths A-B, Outside Texas Bldg.
Titusville Iron Works Co.	6 Beeville Lane
Waukesha Motor Co.	6 Skelly Drive
Weber Engine Co.	7 Arcade Way
Wilson Mfg. Co.	8 Oklahoma City Ave.
Worthington Pump & Machinery Corp.	4 Skelly Drive
Young Engine Corp.	5 Texas Drive

ENGINES—GASOLINE

Buda Co., The	3 Texas Drive
Buda Engine Service of Tulsa	17 Skelly Drive
Buffalo Gasolene Motor Co.	Booths 51-55, California Bldg.
Caterpillar Tractor Co.	10 Skelly Drive
Clark Bros. Co.	3 Oklahoma Drive
Climax Engineering Co.	Booth 6, Continental Supply Bldg.
Cooper, Fred E.	15 Arcade Way
Fairbanks, Morse & Co.	2 Drake Drive
Gaso Pump & Burner Mfg. Co.	Booths 57-58, Texas Bldg.
Hercules Motors Corp.	Booths 76, 77, 78, 133, 134, 135, Okla. Bldg.
International Derrick & Equipment Co.	10 Drake Drive
International Harvester Co.	3 Arcade Way
Landry, Max E.	Booths 51, 53, 54, 55, California Bldg.
Lucey Products Corp.	8 Oil City Way
Novo Engine Co.	5 Drake Drive, National Supply Bldg.
Portable Rig Co.	3 West Virginia Ave.
Shaffer Specialty Co.	7 Oklahoma Drive
Waukesha Motor Co.	6 Skelly Drive
Wilson Mfg. Co.	8 Oklahoma City Ave.
Worthington Pump & Machinery Corp.	4 Skelly Drive
Young Engine Corp.	5 Texas Drive

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Bridgeport Machine Co.	6 Drake Drive
Caterpillar Tractor Co.	10 Skelly Drive
Clark Bros. Co.	3 Oklahoma Drive

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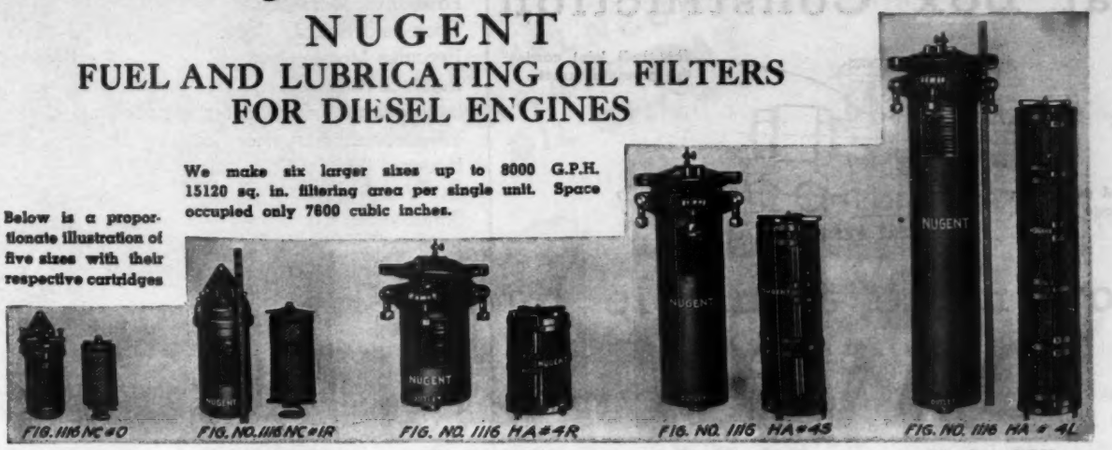

FIG. 1116 NC #0 — Filt. Cap. G.P.H. 5 to 150 — Filtering area 275 sq. in. — Space occupied 272 cu. in. — Price per sq. in. .061c

FIG. NO. 1116 NC #1R — Filt. Cap. G.P.H. 122 to 285 — Filtering area 513 sq. in. — Space occupied 578 cu. in. — Price per sq. in. .0578c

FIG. NO. 1116 HA #4R — Filt. Cap. G.P.H. 442 to 960 — Filtering area 1140 sq. in. — Space occupied 930 cu. in. — Price per sq. in. .0689c

FIG. NO. 1116 HA #4S — Filt. Cap. G.P.H. 640 to 1640 — Filtering area 2280 sq. in. — Space occupied 1504 cu. in. — Price per sq. in. .0456c

FIG. NO. 1116 HA #4L — Filt. Cap. G.P.H. 720 to 1920 — Filtering area 3780 sq. in. — Space occupied 2040 cu. in. — Price per sq. in. .039c

What does this GREAT filtering area mean to you? It MEANS cleaner oil, fewer cleanings per year and very low up-keep.

Compare the above filtering areas, the space occupied and price per sq. inch of filtering area with what you have, and expect to buy.

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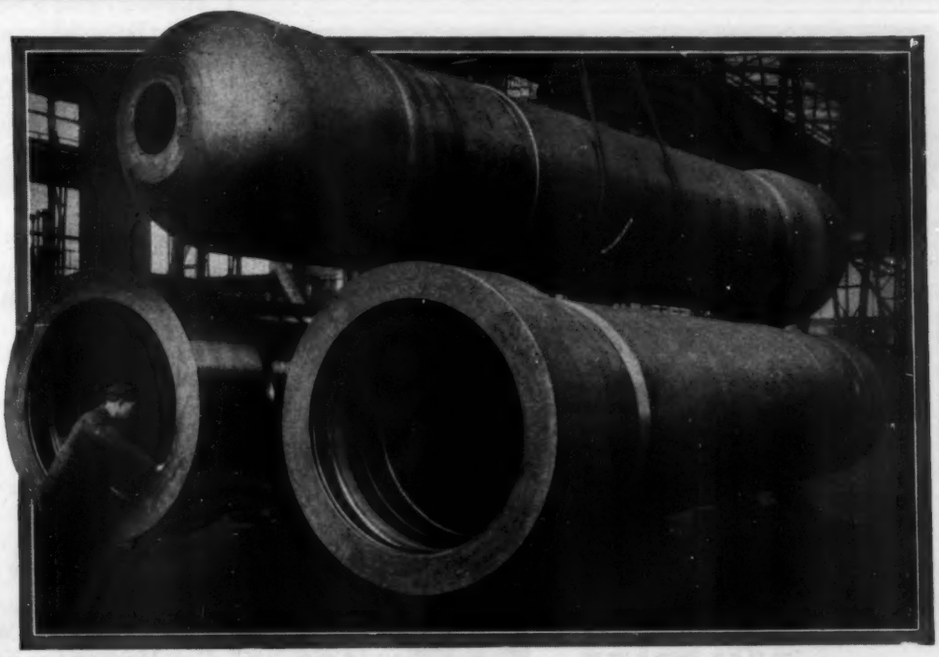

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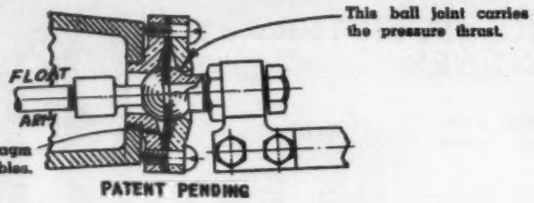

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Ingersoll-Rand Co.	2 Tyler St.
International Derrick & Equipment Co.	10 Drake Drive
International Harvester Co.	3 Arcade Way
National Supply Co.	5 Drake Drive
Oil Well Supply Co.	3 Drake Drive
Portable Rig Co.	3 West Virginia Ave.
Reid Gas Engine Co., Jos.	1 Drake Drive
Republic Supply Co.	Booths 16-21, Texas Bldg.
Shaffer Specialty Co.	7 Oklahoma Drive
Titusville Iron Works Co.	6 Beeville Lane
Waukesha Motor Co.	6 Skelly Drive
Weber Engine Co.	7 Arcade Way
Wilson Mfg. Co.	8 Oklahoma City Ave.
Worthington Pump & Machinery Corp.	4 Skelly Drive
Young Engine Corp.	5 Texas Drive

ENGINES—STEAM—

Ajax Iron Works	5 Drake Drive, National Supply Bldg.
Gardner-Denver Co.	2 Drake Drive, Continental Supply Exhibits
Hydril Co.	Booths A-B, Outside Texas Bldg.
National Supply Co.	5 Drake Drive
Oil Well Supply Co.	3 Drake Drive
Titusville Iron Works Co.	6 Beeville Lane
Worthington Pump & Machinery Corp.	4 Skelly Drive

FABRICATORS

Black, Sivalls & Bryson, Inc.	Booths 39-66, California Bldg.
Chicago Bridge & Iron Works	Booths 86-125, Texas Bldg.
Crane Co.	Booths 50-55, Refiners & Marketers Bldg.
Frick-Reid Supply Corp.	1 Drake Drive
Midwest Piping & Supply Co.	1 Drake Drive
Tulsa Boiler & Machinery Co.	3 California Ave.
Western Iron & Foundry Co.	Booth 17, California Bldg.

FELT—PIPE LINE

Crutcher-Rolfs-Cummings, Inc.	Booths 42-63, California Bldg.
Johns-Manville Corp.	Booth 87, Texas Bldg.
Keasbey-Mattison Co.	Booth 27, Refiners & Marketers Bldg.

FENCE

American Wire Fabrics Corp.	Booths 109-110, Oklahoma Bldg.
Cyclone Fence Co.	Booths 93 to 118 incl., Oklahoma Bldg.

FILTERS—AIR

Air-Maze Corp.	Booth 3, Scientific & Technical Bldg.
American Air Filter Co.	Booths 83-128, Texas Bldg.
Gardner-Denver Co.	2 Drake Drive
Hanlon-Waters, Inc.	Booths 43, 83, 84, 127, 128, Texas Bldg.
McGregor Engineering Co.	Booth 24, Oklahoma Bldg.
Moorlane Co.	Booth 83, Oklahoma Bldg.
Owens-Illinois Glass Co.	Booth 63, Scientific & Technical Bldg.
Vortox Mfg. Co.	Booth 75, Oklahoma Bldg.
Vinson Supply Co.	Booth 133, Texas Bldg.

FILTERS—OIL

Motor Improvements, Inc.	Booth 17, Oklahoma Bldg.
Nugent & Co., Wm. W.	Booth 88, Texas Bldg.
Vogt Machine Co., Henry	Booth 128, Oklahoma Bldg.

FIRE BRICK

Dearborn Chemical Co.	Booth 105, Texas Bldg.
Green Fire Brick Co., A. P.	Booth 56, Scientific & Technical Bldg.
Plibrico Jointless Firebrick Co.	Booth 4, Refiners & Marketers Bldg.
Quigley Co.	Booths 61-62, Refiners & Marketers Bldg.
Royall Fire Brick & Supply Co.	Booth 56, Scientific & Technical Bldg.

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Kettleman North Dome Assn.
North American Consolidated Oil Company
Ohio Oil Co.
O'Kane & Brain
Petroleum Securities Co.
Republic Petroleum Co.
Royalty Service Corp.
Shell Oil Company of California
Standard Oil Company of California
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Wood-Callahan Oil Co.
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Byers Drilling Co.
Carter Oil Co.
Clark & Co.
J. E. Crosbie, Inc.
C. E. Davis
Eason Oil Co.
Francis Oil & Gas Co.
Franklin Drilling Co.
Hall & Briscoe
E. W. Jones, Inc.
Carl B. King Drilling Co.
Kirk-Green-Way, Inc.
Lynch Brothers
J. E. Mabee & Co.
Mannahan Drilling Co.
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Phister Mfg. Co. ..... Booth 2, California Bldg.
Pyrene Mfg. Co. ..... Booths 38-39, Oklahoma Bldg.
Technical Products, Inc. ..... Booth 56, California Bldg.
Walker Co., W. L. .. Booths 56-57, California Bldg., Booth 12, Arcade

FIRE HYDRANTS

Darling Valve & Mfg. Co. ..... Booths 101-102, Oklahoma Bldg.

FITTINGS—CONDUIT

Appleton Electric Co. ..... Booths 63-64, Refiners & Marketers Bldg.
Crouse-Hinds Co. ..... Booths 56-57, Oklahoma Bldg.
Electric Supply Co. ..... Booth 64, California Bldg.

FITTINGS—ORIFICE

American Meter Co. ..... Booths 41-43, Scientific & Technical Bldg.
Byron Jackson Co. ..... Booths 25-28, Oklahoma Bldg.
Hanlon-Waters, Inc. ..... Booths 83-128, Texas Bldg.
Moorlane Co. ..... Booth 83, Oklahoma Bldg.
Robinson Orifice Fitting Co. Booths 41-43, Scientific & Technical Bldg.
Westcott & Greis, Inc. .. Booths 41, 42, 43, Scientific & Technical Bldg.

FITTINGS—PIPE

Allen, Sproull & Allen ..... Booth 10, Scientific & Technical Bldg.
American Rolling Mill Co. ..... Booths 70-71, Oklahoma Bldg.
Beaumont Iron Works Co. ..... 1 Drake Drive
Crane Co. ..... Booths 50, 51, 54, 55, Refiners & Marketers Bldg.
Flagg & Co., Stanley G. ..... Booth 10, Scientific & Technical Bldg.
Frick-Reid Supply Corp. ..... 1 Drake Drive
Gray Tool Co. ..... Booths 89, 90, 121, 122, Oklahoma Bldg.
Jarecki Mfg. Co. ..... Booths 79-132, Texas Bldg.
Kerotest Valve Co. ..... Booths 89, 90, 121, 122, Oklahoma Bldg.
Key Co. ..... Booths 65-66, Refiners & Marketers Bldg.
Lunkenheimer Co. ..... Booths 130-131, Oklahoma Bldg.
Midwest Piping & Supply Co. ..... 1 Drake Drive
Moorlane Co. ..... Booth 83, Oklahoma Bldg.
Morrison Bros. ..... Booth 5, Refiners & Marketers Bldg.
Nugent & Co., Wm. W. ..... Booth 88, Texas Bldg.
Pittsburgh Valve & Fittings Co. ..... 7 Arcade Way
Reading-Pratt & Cady Co., Inc. ..... Booth 85, Oklahoma Bldg.
Taylor Forge & Pipe Works ..... Booth 84, Oklahoma Bldg.
Victaulic Co. of America ..... Booth 84, Texas Bldg.
Vogt Machine Co., Henry ..... Booth 128, Oklahoma Bldg.
Walworth Co. ..... Booths 104-107, Oklahoma Bldg.
Westcott & Greis, Inc. .. Booths 41, 42, 43, Scientific & Technical Bldg.
Westcott Valve Co. ..... Booths 9-10, Continental Supply Bldg.
Williams Valve Co., D. T. ..... Booth 10, Scientific & Technical Bldg.
Worthington Pump & Machinery Corp. ..... 4 Skelly Drive
Youngstown Steel Products Co. ... Booth 4, Continental Supply Bldg.

FITTINGS—TANK

Black, Sivalls & Bryson, Inc. ..... Booths 39-66, California Bldg.
Crane Co. ..... Booths 50-55, Refiners & Marketers Bldg.
Johnston & Jennings Co. ..... Booth 82-129, Oklahoma Bldg.
Maloney Tank Mfg. Co. .. Booth 14, Ref. & Mark. Bldg., 21 Okla. Drive
McGregor Engineering Co. ..... Booth 24, Oklahoma Bldg.
Moorlane Co. ..... Booth 83, Oklahoma Bldg.
National Tank Co. ..... Booths 96-115, Texas Bldg., 9 Oil City Way
Parkersburg Rig & Reel Co. .. Booths 74-75, Texas Bldg., 12 Drake Drive
Walworth Co. ..... Booths 104-107, Oklahoma Bldg.

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Chicago Bridge & Iron Works ..... Booths 86-125, Texas Bldg.
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Vogt Machine Co., Henry . . . . . Booth 128, Oklahoma Bldg.

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Goodrich Electric Co. . . . . Booths 41-42, Refiners & Marketers Bldg.
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Goodyear Tire & Rubber Co. . . . . Booths 52, 53, 54, Texas Bldg.
Gustin-Bacon Mfg. Co. . . . . Booths 52, 53, 54, Texas Bldg.
Hewitt Rubber Corp. . . . . Booths 79-132, Texas Bldg.
Johns-Manville Corp. . . . . Booth 87, Texas Bldg.
Linear Packing & Rubber Co. . . . . 1 Drake Drive
Maloney Tank Mfg. Co. . . Booth 14, Ref. & Mark. Bldg., 21 Okla. Drive
McCord Radiator & Mfg. Co. . . . . Booths 72-73, Oklahoma Bldg.
National Tank Co. . . . . Booths 96-115, Texas Bldg., 9 Oil City Way
Parkersburg Rig & Reel Co. . Booths 74-75, Texas Bldg., 12 Drake Drive
Thermoid Rubber Co. . . . . 3 Drake Drive

GAS LIFT DEVICES

Gas Power, Inc. . . . . Booth 27, California Bldg.
Mission Mfg. Co. . . . . Booths 119-120, Texas Bldg.

GAUGES

Allen, Sproull & Allen . . . . . Booth 10, Scientific & Technical Bldg.
American Meter Co. . . . . Booths 41-43, Scientific & Technical Bldg.
Bristol Co. . . . . Booths 1-2, Scientific & Technical Bldg.
Brown Instrument Co. . . . . Booths 39-64, Scientific & Technical Bldg.
Carrick Engineering Co. . . . . Booths 8-9, Scientific & Technical Bldg.
Consolidated Ashcroft Hancock Co. . . Booths 8-9, Scien. & Tech. Bldg.
Crane Co. . . . . Booths 50-55, Refiners & Marketers Bldg.
Crosby Steam Gage & Valve Co. . . Booths 41-43, Scien. & Tech. Bldg.
Foxboro Co. . . . . Booths 4-6, Scientific & Technical Bldg.
Hanlon-Waters, Inc. . . . . Booths 83-128, Texas Bldg.
Hays Corp. . . . . Booths 8-9, Scientific & Technical Bldg.
Johnston & Jennings Co. . . . . Booths 82-129, Oklahoma Bldg.
Kinley Co., M. M. . . . . 5 Fitts St.
Lunkenheimer Co. . . . . Booths 130-131, Oklahoma Bldg.
Martin-Decker Corp. . . . . Booth 12, Texas Bldg.
Refinery Supply Co. . . . . Booths 8-9, Scientific & Technical Bldg.
Tagliabue Mfg. Co., C. J. . . . . Booths 32-33, Scien. & Tech. Bldg.
Tokheim Co. . . . . Booth 44, Refiners & Marketers Bldg.
United States Gauge Co. . . . . Booths 8, 9, 10, Scien. & Tech. Bldg.
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Smith Separator Co. ..... Booths 90, 121, 122, Texas Bldg.

GOGGLES

American Optical Co. ..... Booth 57, Scientific & Technical Bldg.
Union Carbide & Carbon Co. ..... Booths 6, 7, 8, 9, California Bldg.

GOVERNORS

American Meter Co. ..... Booths 41-43, Scientific & Technical Bldg.
Chaplin-Fulton Mfg. Co. ..... Booth 40, Scientific & Technical Bldg.
Fisher Governor Co. ..... Booth 89, Texas Bldg.
Gardner-Denver Co. ..... 2 Drake Drive
Hanlon-Waters, Inc. ..... Booths 83-128, Texas Bldg.
Mason-Neilan Regulator Co. ..... Booths 14-15, Arcade
Midwest Equitable Meter Co. ..... Booths 37-38, Scien. & Tech. Bldg.
Moorlane Co. ..... Booth 83, Oklahoma Bldg.
Pittsburgh Equitable Meter Co. ..... 6 Arcade Way
Smith Separator Co. ..... Booths 90, 121, 122, Texas Bldg.
Young Engine Corp. ..... 5 Texas Drive

GRATING

Arrowhead Iron Works, Inc. ..... Booth 133, Texas Bldg.
Blaw-Knox Co. ..... 1 Drake Drive
Vinson Supply Co. ..... Booth 133, Texas Bldg.

GRINDING MACHINERY

Safety Grinding Wheel Co. ..... Booth 8, Arcade, 11 Arcade Way

GUN PERFORATOR

Lane-Wells Co. ..... 7 Skelly Drive

HAND HOLE COVER

Key Co. ..... Booths 65-66, Refiners & Marketers Bldg.

HANGERS—BEAM

American Steel Derrick Co. ..... 8 Drake Drive
Bridgeport Machine Co. ..... 6 Drake Drive
International Derrick & Equipment Co. ..... 10 Drake Drive
Moore & Co., Lee C. ..... Booths 65-66, Oklahoma Bldg.
Oil Country Specialties Mfg. Co. Booths 10-11, Okla., 1 Skelly Drive
Parkersburg Rig & Reel Co. Booths 74-75, Texas Bldg., 12 Drake Drive
Ratigan, J. P. ..... 1 Drake Drive

HANGERS—ROD

Axelson Mfg. Co. ..... 1 Drake Drive
Bridgeport Machine Co. ..... 6 Drake Drive
Engineering Co., The ..... Booths 79-132, Texas Bldg.
Frick-Reid Supply Corp. ..... 1 Drake Drive
Jarecki Mfg. Co. ..... Booths 79-132, Texas Bldg.
Muskogee Iron Works ..... 9 Skelly Drive
Oil Country Specialties Mfg. Co. Booths 10-11, Okla., 1 Skelly Drive
Parkersburg Rig & Reel Co. Booths 74-75, Texas Bldg., 12 Drake Drive
Ratigan, J. P. ..... 1 Drake Drive
W-K-M Co., Inc. ..... Booths 60, 61, 62. 43, 44, 45, California Bldg.

HEADS—CASING & TUBING

American Iron & Machine Works ..... Booths 51-52, Oklahoma Bldg.
Baash-Ross Tool Co. ..... Booth 69, Texas Bldg.
Beaumont Iron Works Co. ..... 1 Drake Drive
Brauer Machine & Supply Co. ..... Booth 16, California Bldg.
Cameron Iron Works Co. ..... 7 Pennsylvania Ave
Gray Tool Co. ..... Booths 89, 90, 121, 122, Oklahoma Bldg.
Guiberson Corp. ..... Booths 106-107, Texas Bldg.
Hercules Tool Co. ..... Booths 55-56, Texas Bldg.
Hinderliter Tool Co. ..... Booths 22, 23, 24, Texas Bldg.
Houston Engineers ..... Booths 60, 61, 62, 43, 44, 45, California Bldg.
Hughes Tool Co. ..... Booths 91-93, Texas Bldg.
Hydril Co. ..... Booths A-B, Outside Texas Bldg.
Jarecki Mfg. Co. ..... Booths 79-132, Texas Bldg.
Kerotest Mfg. Co. ..... Booths 89, 90, 121, 122, Oklahoma Bldg.
Larkin Packer Co. ..... Booths 80-81, Oklahoma Bldg.
Lucey Products Corp. ..... 8 Oil City Way
MacClatchie Mfg. Co. ..... 2 Drake Drive
Oil Well Improvements Co. ..... Booths 94, 95, 116, Texas Bldg.
Rector Well Equipment Co. ..... Booth 21, Oklahoma Bldg.
Shaffer Specialty Co. ..... 7 Oklahoma Drive
Walworth Co. ..... Booths 104-107, Oklahoma Bldg.

HEADS—DRILLING

Crane Co. ..... Booths 50-55, Refiners & Marketers Bldg.
Hinderliter Tool Co. ..... Booths 22-24, Texas Bldg.
Hughes Tool Co. ..... Booths 91-93, Texas Bldg.
Kerotest Mfg. Co. ..... Booths 89-122, Oklahoma Bldg.
Otis Pressure Control Co. ..... Booth 35, Oklahoma Bldg.
Rector Well Equipment Co. ..... Booth 21, Oklahoma Bldg.
W-K-M Co., Inc. ..... Booths 60, 61, 62, 43, 44, 45, California Bldg.

HEAT EXCHANGERS

Black, Sivalls & Bryson, Inc. ..... Booths 39-66, California Bldg.
Crane Co. ..... Booths 50-55, Refiners & Marketers Bldg.
Elliott Co. ..... Booth 111, Oklahoma Bldg.
Frick Co. ..... Booths 42-63, California Bldg.
Ingersoll-Rand Co. ..... 2 Tyler St.
Key Co. ..... Booths 65-66, Refiners & Marketers Bldg.
National Radiator Co. ..... Booths 12-13, California Bldg.
Smith Corp., A. O. ..... Booths 87-88, Oklahoma Bldg.
Tulsa Boiler & Machinery Co. ..... 3 California Way
Vogt Machine Co., Henry ..... Booth 128, Oklahoma Bldg.
Westinghouse Electric & Mfg. Co. ..... Booths 91-128, Oklahoma Bldg.
Worthington Pump & Machinery Corp. ..... 4 Skelly Drive

HOISTS

Allsteel Products Mfg. Co. ..... 9 Arcade Way
Brauer Machine & Supply Co. ..... Booth 16, California Bldg.
Coffing Hoist Co. ..... Booth 50, California Bldg.
Cooper, Fred E. ..... 15 Arcade Way
Crutcher-Rolfs-Cummings, Inc. Booths 60-62, 43-45, California Bldg.
Franks Mfg. Co. ..... 3 Arcade Way
Mission Mfg. Co. ..... Booths 119-120, Texas Bldg.
Muskogee Iron Works ..... 9 Skelly Drive
Shaffer Specialty Co. ..... 7 Oklahoma Drive
Spang & Co. ..... Booths 47-58, California Bldg.
Sullivan Machinery Co. ..... 3 Beeville Lane
Wilson Manufacturing Co. ..... 8 Oklahoma City Ave.
Wright Mfg. Div., American Chain Co. ..... Booth 1, Arcade
Yale & Towne Mfg. Co. ..... Booth 30, Refiners & Marketers Bldg.

HOSE—CLAMP & FITTING

Hose Stay-Put Tool Co. ..... Booth 18, California Bldg.

HOSE—ROTARY

Chicksan Oil Tool Co., Ltd. Booths 25-26, Refiners & Marketers Bldg.
Goodrich Rubber Co., B. F. ..... Booth 43, Texas Bldg.
Goodyear Tire & Rubber Co. ..... Booths 52, 53, 54, Texas Bldg.
Gustin-Bacon Mfg. Co. ..... Booths 52, 53, 54, Texas Bldg.
Hewitt Rubber Corp. ..... Booths 79-132, Texas Bldg.
Lucey Products Corp. ..... 8 Oil City Way
MacClatchie Mfg. Co. ..... 2 Drake Drive
Republic Rubber Co. ..... Booths 25, 26, 27, Texas Bldg.
Shaffer Specialty Co. ..... 7 Oklahoma Drive
Thermoid Rubber Co. ..... 3 Drake Drive

INSTRUMENTS—DRILLING CONTROL

Cameron Iron Works Co. ..... 7 Pennsylvania Ave
Line Scale Co., Inc. ..... Booth 25, California Bldg.
Martin-Decker Corp. ..... Booth 12, Texas Bldg.
Reed Roller Bit Co. ..... Booths 12, 13, 14, Texas Bldg.

INSTRUMENTS—GAS ANALYSIS

Hays Corp. ..... Booths 8-9, Scientific & Technical Bldg.

INSTRUMENTS—INDICATING, RECORDING & CONTROLLING

Bristol Co. ..... Booths 1-2, Scientific & Technical Bldg.
Brown Instrument Co. ..... Booths 39-64, Scientific & Technical Bldg.
Carrick Engineering Co. ..... Booths 8-9, Scientific & Technical Bldg.
Consolidated Ashcroft Hancock Co. Booths 8-9, Scien. & Tech. Bldg.
Crosby Steam Gage & Valve Co. Booths 41-43, Scien. & Tech. Bldg.
Fisher Governor Co. ..... Booth 89, Texas Bldg.
Foxboro Co. ..... Booths 4, 5, 6, Scientific & Technical Bldg.
General Electric Co. ..... 2 Drake Drive

THE MID-CONTINENT'S *Toughest* PUMPING AREA

Pumping Wells are equipped with

PACIFIC
OIL WELL PUMPS

Forty-five of the leading companies operating in the Oklahoma City field HAVE MORE WELLS using PACIFIC Oil Well Pumps than any competitive make. PACIFIC Pumps are doing the job in 7 out of every 10 pumping wells in the Mid-Continent's *"toughest"* pumping area —a significant endorsement by the men on the job, of the MO-LOY Metal Liners and hard surface Plungers that have made possible the sensational high performance of the PACIFIC *Close Fit Metal Pump.*

Introduced less than four years ago, PACIFIC Pumps are running up new performance records where pumping conditions are toughest—performance made possible by the exclusive PACIFIC MO-LOY Metal Liners that allow close tolerances of one to two-thousandths of an inch, essential in deep well pumping. With no other metal can you secure such high efficiency with such close tolerances—in no other pump can you have PACIFIC MO-LOY Metal!

If you are using PACIFIC Oil Well Pumps, there's no need to tell you of PACIFIC performance—*you know!* If you never have used PACIFIC—*then write now for* BULLETIN No. 63.

Manufactured By

PACIFIC PUMP WORKS HUNTINGTON PARK CALIFORNIA

Distributed in Mid-Continent By

MID CONTINENT PUMP SUPPLY CO.

915 East Second Street, TULSA, OKLAHOMA

BRANCHES: Drumright, Seminole, Oklahoma El Dorado, Arkansas

Distributed in Kansas By THE BOVAIRD SUPPLY CO

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Distributed in Texas and Louisiana By MID-CONTINENT SUPPLY CO.

Leeds & Northrup Co. ..... Booths 29-30, Scientific & Technical Bldg.
Mason-Neilan Regulator Co. ..... Booths 14-15, Arcade
Minneapolis-Honeywell Reg. Co. ..Booths 39-64, Scien. & Tech. Bldg.
Tagliabue Mfg. Co., C. J. ... Booths 32-33, Scientific & Technical Bldg.
Taylor Instrument Companies .... Booths 35-36, Scien. & Tech. Bldg.
Westcott & Greis, Inc. ..... Booths 41-43, Scientific & Technical Bldg.
Westinghouse Electric & Mfg. Co. .... Booths 91-120, Oklahoma Bldg.

INSULATION

Crane Co. ..... Booths 50-55, Refiners & Marketers Bldg.
Eagle-Picher Sales Co. .... Booths 27-28, Scientific & Technical Bldg.
Gustin-Bacon Mfg. Co. ..... Booths 52, 53, 54, Texas Bldg.
Johns-Manville Mfg. Corp. ..... Booth 87, Texas Bldg.
Keasbey & Mattison Co. ..... Booth 27, Refiners & Marketers Bldg.
Owens-Illinois Glass Co. .... Booth 63, Scientific & Technical Bldg.

INSULATION JACKETS FOR BOILERS

Lucey Products Corp. ..... 8 Oil City Way

JACKS—LIFTING

Duff-Norton Mfg. Co. ..... Booth 64, Oklahoma Bldg.
Joyce-Cridland Co. ..... Booths 49-50, Texas Bldg.
Templeton, Kenly & Co. ..... Booth 42, Texas Bldg.

JACKS—PUMPING

Bovaird Supply Co. ..... Booths 25-27, Texas Bldg.
Bridgeport Machine Co. ..... 6 Drake Drive
Continental Supply Co. ..... 2 Drake Drive
International Derrick & Equipment Co. ..... 10 Drake Drive
Jensen Bros. Mfg. Co. ..... 5 Pennsylvania Ave.
Lufkin Foundry & Machine Co. ..... 15 Skelly Drive
National Supply Co. ..... 5 Drake Drive
Norris Manufacturer, Inc., W. C. ..... Booth 8 Arcade; 11 Arcade Way
Oil Well Supply Co. ..... 3 Drake Drive
Parkersburg Rig & Reel Co. Booths 74-75, Texas Bldg., 12 Drake Drive
Ratigan, J. P. ..... 1 Drake Drive

JARS

Baash-Ross Tool Co. ..... Booth 69, Texas Bldg.
Hinderliter Tool Co. ..... Booths 22-24, Texas Bldg.
Houston Engineers .... Booths 60, 61, 62, 43, 44, 45, California Bldg.
International Derrick & Equipment Co. ..... 10 Drake Drive
Spang & Co. ..... Booths 47-58, California Bldg.

JOINTS—LOADING RACK

Chiksan Oil Tool Co., Ltd. . .Booths 25-26 Refiners & Marketers Bldg.

JOINT SEALING COMPOUNDS

Key Co. ..... Booths 65-66, Refiners & Marketers Bldg.

LABORATORY SUPPLIES

Coors Porcelain Co. ..... Booths 8-9, Scientific & Technical Bldg.
Cochrane Corp. ..... Booths 8-9, Scientific & Technical Bldg.
Corning Glass Works ..... Booths 8-9, Scientific & Technical Bldg.
Kimble Glass Co. ..... Booths 8-9, Scientific & Technical Bldg.
Meriam Co. ..... Booths 41-43, Scientific & Technical Bldg.
Podbielniak Industrial Res. & Egr. Lab. . . Booths 12-13, Scien. & Tech.
Refinery Supply Co. ..... Booths 8-9, Scientific & Technical Bldg.

LANTERNS

Economy Electric Lantern Co. ..... Booth 15, Texas Bldg.
Gates Hardware Co. ..... 13 Skelly Drive
National Carbide Sales Corp. ..... Booth 30, Oklahoma Bldg.

LEAD PRODUCTS

Eagle-Picher Sales Co. .... Booths 27-28, Scientific & Technical Bldg.
National Lead Co. ..... Booth 46, Scientific & Technical Bldg.

LEAD—WHITE

Eagle-Picher Sales Co. .... Booths 27-28, Scientific & Technical Bldg.
National Lead Co. ..... Booth 46, Scientific & Technical Bldg.

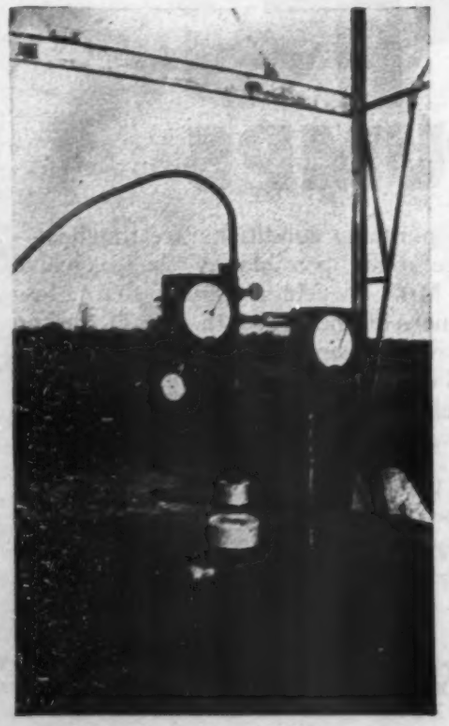
LEAD WOOL

Eagle-Picher Sales Co. ..... Booths 27-28, Scientific & Technical Bldg.
National Lead Co. ..... Booth 46, Scientific & Technical Bldg.

LIGHTING EQUIPMENT

Allis-Chalmers Mfg. Co. ..... 2 Oil City Way, 15 Arcade Way
Appleton Electric Co. ..... Booths 63-64, Refiners & Marketers Bldg.

It Set Engineers to Thinking at the Houston Show!



Field View of a G-P-I Hook-up

G-P-I SYSTEM

Patented and Patents Pending

Because, by our Working Model, they were able to actually see how it works and the revolutionary advantages of this Gas Lift System of Flowing Oil Wells over conventional methods.

NOW . . . the same Working Model is in operation for your study at the Tulsa Exposition,

BOOTH 27, California Bldg.

For uninterrupted study of this G-P-I Working Model special appointments are invited.

SOUNDNESS OF DESIGN

Gas Power-Incorporated

Houston GPI SYSTEM Texas

EXPERIENCE IN HANDLING

Multi-Flame Lindewelding

On this 8-in. pipe line for crude oil service metallurgically sound welds are assured by Multi-Flame Lindewelding.

makes Pipe Line Joints *leakproof forever*

THE Multi-Flame Lindeweld embodies these four inherent features which promote high-efficiency joints:

Strength. Lindewelds consistently develop the full strength of line pipe—65,000 lb. to 75,000 lb. per sq. in. Even on base material having a tensile strength, as high as 110,000 lb. per sq. in. the Lindeweld is as strong as the parent metal.

Ductility. The multi-flame preheats the base metal before and post-heats the weld after welding, thus making the Lindeweld unusually ductile.

Corrosion Resistance. The ability of oxy-acetylene welds to resist rust and pitting so often revealed during the reconditioning of old lines is fully developed in the Multi-Flame Lindeweld.

Density. The weld deposit from Oxweld No. 24 Lindeweld Process Welding Rod is homogeneous, dense, and defect-free.

This new technique of welding thus assures the satisfactory performance of a pipe line. At the same time it doubles or triples the daily production of sound welded joints and saves 15 to 40 per cent in oxygen, acetylene and welding rod consumed.

Linde Service Operators because of long experience in the pipe line field can help you take full advantage of this economical construction method. Linde Offices will gladly supply complete information and arrange a showing of the new motion picture on Multi-Flame Lindewelding for your organization. The Linde Air Products Company, Unit of Union Carbide and Carbon Corporation, New York and principal cities.

Everything for Oxy-Acetylene Welding and Cutting

LINDE OXYGEN • PREST-O-LITE ACETYLENE • OXWELD APPARATUS AND SUPPLIES FROM UCC LINDE UNION CARBIDE

SEE THESE BAKER TOOLS

1 BAKER CEMENT FLOAT SHOE
2 BAKER CEMENT FLOAT COLLAR
3 BAKER CEMENT WHIRLER SHOE
4 BAKER CEMENT GUIDE SHOE
5 BAKER MODEL F CEMENT RETAINER

A hearty Baker Welcome awaits all visitors to the Tulsa Exposition, May 16 to 23, 1936! In Booths 99 and 112 of the Oklahoma Building, full size models, and moving displays will be demonstrated by Practical Baker Representatives. You are cordially invited to pay us a visit!

1

With the adoption of "red" concrete as standard, Baker Cement Float Shoes provide maximum efficiency. The Bakelite ball valve double-seals against rubber backed by Bakelite at the slightest reversal of pressure; the special made shoe, with plug and valve made of Bakelite and Baker-formula concrete, is stronger than the casing; the complete "drillability" of both concrete and Bakelite eliminates any delay or danger when drilling out and drilling up — absence of metal leaves the hole always ready for immediate coring or "straight-hole" drilling.

2

Many operators use a Baker Cement Float Collar to stop the cementing plug a joint or two above bottom and retain cement "tailings" *inside* the casing. Internal construction is the same as the Baker Cement Float Shoe, and all advantages are retained. Used with a Baker Cement Guide Shoe for average length strings, or with a Baker Cement Float Shoe where an extra measure of safety is desirable.

3

More and more operators are adopting the Baker Cement Whirler Shoe as the "ultimate" device of its kind. It includes all the features of efficiency and safety present in the Baker Cement Float Shoe, with a "plus value"! A number of baffled side ports lead out from the valve chamber and serve to direct the cement upward with a whirling motion that insures complete, even distribution around the casing and minimizes danger of channeling.

4

Baker Cement Guide Shoes possess the vital Baker Drillability feature, and are used in combination with Baker Cement Float Collars, described above.

5

The Baker Model F Cement Retainer with Circulation Jar provides for the placement of cement in a well, under pressure, through tubing or drill pipe. Particularly adaptable where circulation cannot be secured, or can be broken only under great pressure; also used as

BAKER

at TULSA

a Casing Bridge Plug. This efficient device is applied for Re-Cementing, Series Cementing, Cementing Behind Sections of Pipe, Plugging off Bottom Water or Plugging Back to Upper Zones, and other uses.

6

Baker Rotary Wall Scrapers are being universally used for (a) scraping rotary mud from the productive sand for bringing in a bigger well easily and in less time; (b) enlarging the hole to permit placing of a thicker body of cement around shoe and casing; (c) wall-scraping a larger diameter for setting casing in "tight" holes, or running liners without turning down couplings; and many other purposes. The blades are opened by hydraulic pressure from the pumps, and always close when their work is done — thus providing maximum safety.

7

The advantages of a back-pressure valve in the drilling string are well known, but not until the "threadless valve" was introduced in the Bakwik Drill Pipe Float were operators unanimous in approving such devices. The Bakwik Float body need not be removed from the string at any time, as the valve assembly is quickly and easily removed or replaced by hand. Its many advantages are described in the Baker Catalog, and on Pages 205 to 207 of the 1936 Composite Catalog.

8

The Baker Rotary Wall Sampler takes *cores from the side walls* of a drilled hole, operating at any depth in a safe and efficient manner. The complete Wall Sampler is a "double value" investment, since the body is identical to the Baker Rotary Wall Scraper and by *changing blades only* you can perform the many profitable operations described under Paragraph 6 above.

9

The Baker Cable Tool Core Barrel is unequalled for taking cores from all formations by the cable tool method. Accurate, complete cores are secured at low cost, and any experienced driller can operate it successfully.

General Offices and Plant

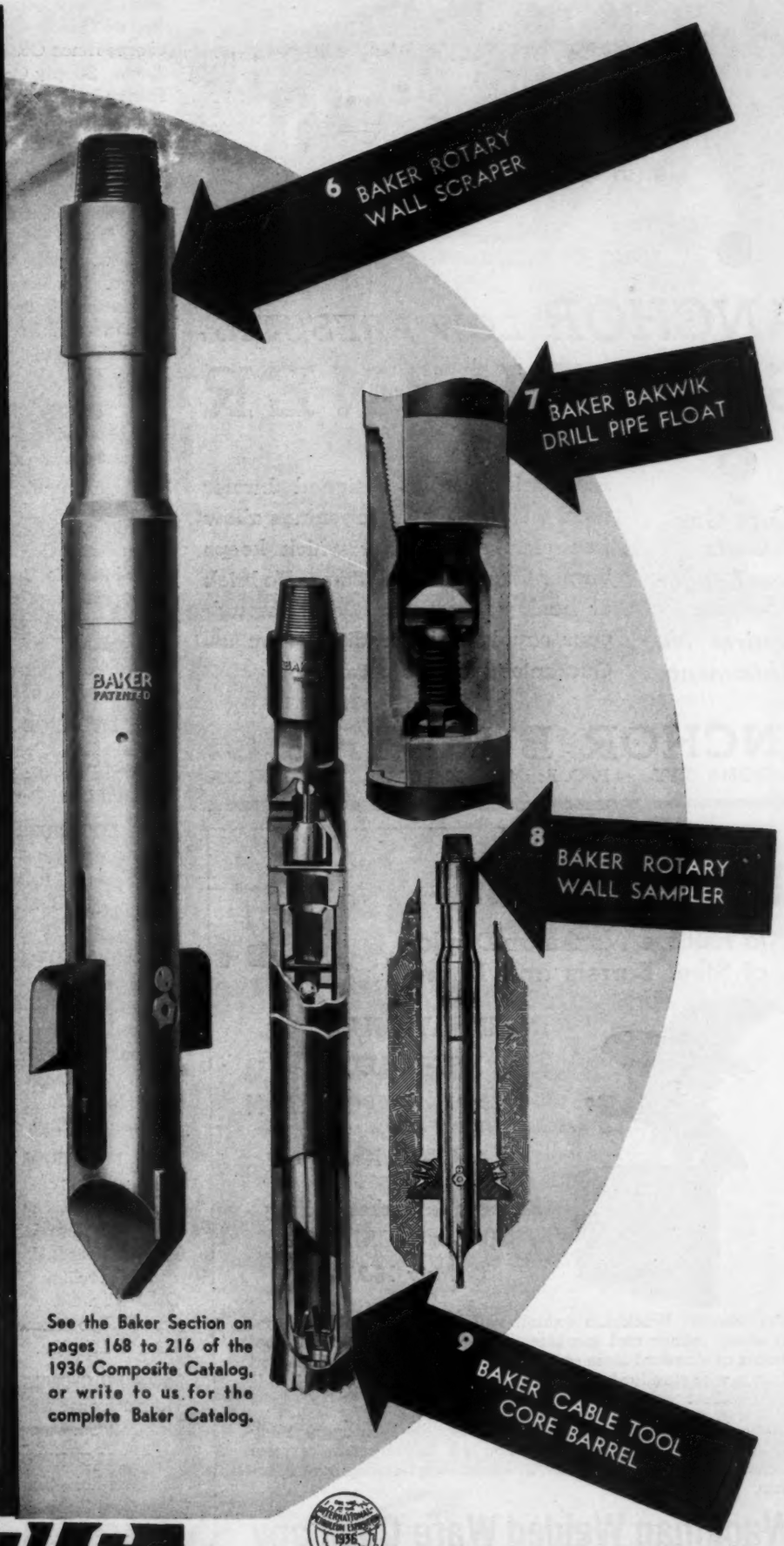
BAKER OIL TOOLS, INC.

2159 East Slauson Ave.
Mail Address: Box 71
Huntington Park, California

A new, modern factory, warehouse and office now nearing completion at—
HOUSTON, TEXAS

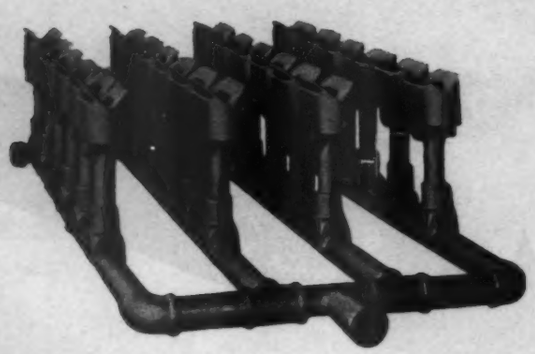
Sales Office and Warehouse at—
Tulsa

Sales offices at:
Shreveport; Midland, Texas; Oklahoma City; New York City; Coalinga, Taft and Bakersfield, California


6 BAKER ROTARY WALL SCRAPER
7 BAKER BAKWIK DRILL PIPE FLOAT
8 BAKER ROTARY WALL SAMPLER
9 BAKER CABLE TOOL CORE BARREL
BAKER
PATENTED

See the Baker Section on pages 168 to 216 of the 1936 Composite Catalog, or write to us for the complete Baker Catalog.

OIL TOOLS



ANCHOR LOW PRESSURE GAS BURNER

Cuts Gas Costs
Gives Longer Service
Requires No Adjustments

New scientifically designed burner head with two air port openings allow free circulation of air which keeps burner head cool at all times. No brick or banking required. Order through your supply store or direct from us. Guaranteed to give satisfaction.

ANCHOR BURNER CO.

OKLAHOMA CITY P. O. Box 4 Dial 3-8221 OKLAHOMA

Inviting You---

to visit the Wackman Display of Steel Barrels and Drums.

INTERNATIONAL PETROLEUM EXPOSITION

BOOTH No. 7

Refiners & Marketers Bldg.
TULSA, OKLAHOMA
May 16-23

The colorful Wackman exhibit will be of particular interest to every refiner and marketer. You will see displayed steel drums of standard sizes and styles, as well as newly designed drums, with standard painting and attractively decorated heads and bodies.

These drums on display strikingly reflect the Wackman policy of continual endeavor to maintain the manufacture of steel containers on a high plane of skilled engineering craftsmanship.

Wackman Welded Ware Company

General Offices—Seventh and Victor Streets—St. Louis, Mo.

FIVE MODERN PLANTS

St. Louis, Mo., Kansas City, Mo., New Orleans, La., Houston, Tex., Chester, Pa.

Buda Engine Service Co. ..... 17 Skelly Drive
Buffalo Gasolene Motor Co. ..... Booths 51-55, Oklahoma Bldg.
Crouse-Hinds Co. ..... Booths 56-57, Oklahoma Bldg.
Electric Supply Co. ..... Booth 64, California Bldg.
Fairbanks-Morse & Co. ..... 2 Drake Drive
General Electric Co. ..... 2 Drake Drive
Goodrich Electric Co. ..... Booths 41-42, Refiners & Marketers Bldg.
Harnischfeger Sales Corp. ..... 8 Seminole St.
Lacy Co. ..... Booths 60, 61, 62, 43, 44, 45, California Bldg.
Lucey Products Corp. ..... 8 Oil City Way
Novo Engine Co. ..... 5 Drake Drive, National Supply Bldg.
Shaffer Specialty Co. ..... 7 Oklahoma Drive
Sullivan Machinery Co. ..... 3 Beeville Lane
Waukesha Motor Co. ..... 6 Skelly Drive
Westinghouse Electric & Mfg. Co. .... Booths 91-120, Oklahoma Bldg.
W-K-M Co., Inc. ..... Booths 60, 61, 62, 43, 44, 45, California Bldg.
Young Engine Corp. ..... 5 Texas Drive

LINING—BRAKE

Bridgeport Machine Co. ..... 6 Drake Drive
Carson Machine & Supply Co. ..... Booth 46, California Bldg.
Garlock Packing Co. ..... Booths 59-60, Texas Bldg.
Gatke Corp. ..... Booths 23-24, California Bldg.
Hydril Co. ..... Booths A-B, Outside Texas Bldg.
International Derrick & Equipment Co. ..... 10 Drake Drive
Johns-Manville Corp. ..... Booth 87, Texas Bldg.
Lucey Products Corp. ..... 8 Oil City Way
Manhattan Rubber Mfg. Div. .. 5 Drake Drive, National Supply Bldg.
Parkersburg Rig & Reel Co.. Booths 74-75, Texas Bldg., 12 Drake Drive
Raybestos-Manhattan, Inc. ..... 1 Drake Drive
Thermoid Rubber Co. ..... 3 Drake Drive

LITHARGE

Eagle-Picher Sales Co. ..... 27-28, Scientific & Technical Bldg.
General Paint Corp. ..... Booths 38-39, Texas Bldg.
National Lead Co. ..... Booth 46, Scientific & Technical Bldg.

LOCKNUTS

Brauer Machine & Supply Co. ..... Booth 16, California Bldg.
Elastic Stop Nut Corp. ..... Booth 16, California Bldg.

LUBRICATORS & LUBRICATING DEVICES

Ajax Iron Works ..... 5 Drake Drive
Hills-McCanna Co. ..... Booth 1, California Bldg.
Lunkenheimer Co. ..... Booths 130-131, Oklahoma Bldg.
Manzel Bros. Co. ..... Booth 50, Oklahoma Bldg.
McCord Radiator & Mfg. Co. ..... Booths 72-73, Oklahoma Bldg.
Nugent & Co., W. W. ..... Booth 88, Texas Bldg.
Smith Separator Co. ..... Booths 90, 121, 122, Texas Bldg.
Soph, Edward ..... Booths 1, 12, 13, California Bldg.
Williams, D. T., Valve Co. .... Booth 10, Scientific & Technical Bldg.

MACHINES—CUTTING & THREADING

Beaver Pipe Tools, Inc. ..... Booth 42, Oklahoma Bldg.
Crane Co. ..... Booths 50-55, Refiners & Marketers Bldg.
Greenfield Tap & Die Corp. ..... 13 Skelly Drive
Hanlon-Waters, Inc. ..... Booths 83-128, Texas Bldg.
Landis Machine Co. ..... Booths 6-7, Oklahoma Bldg.
Oster Mfg. Co. ..... Booths 59, 60, 61, 62, 63, Oklahoma Bldg.
Toledo Pipe Threading Machine Co. .. Booths 30-31, California Bldg.
Trimont Mfg. Co. ..... Booth 100, Oklahoma Bldg.

MACHINES—EXCAVATING

Harnischfeger Sales Corp. ..... 8 Seminole St.
Link-Belt Co. ..... Booths 61-63, Texas Bldg.

MACHINES—PIPE CLEANING

Crutcher-Rolfs-Cummings, Inc.. Booths 60-62, 43-45, California Bldg.
New Deal Specialty Co., Inc. ..... 11 Oklahoma Drive
W-K-M Co., Inc. ..... Booths 60, 61, 62, 43, 44, 45, California Bldg.

MACHINES—PIPE COATING

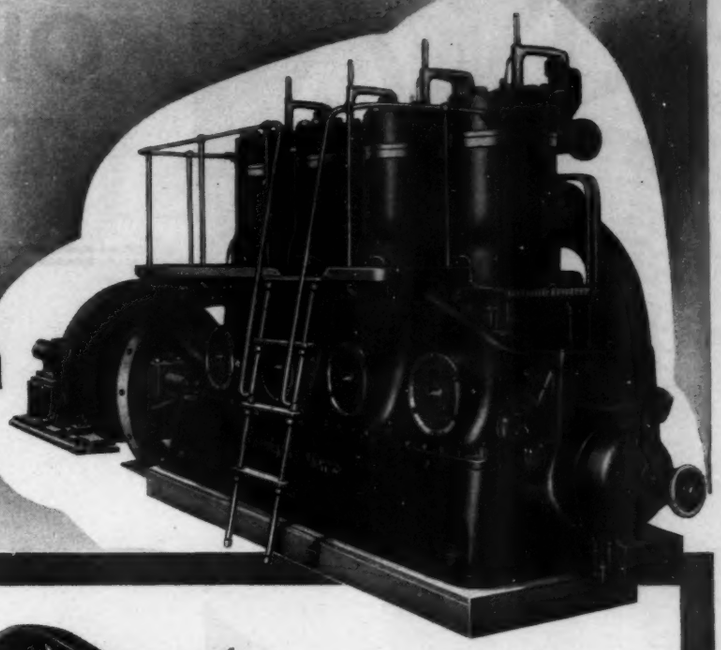
Crutcher-Rolfs-Cummings, Inc.. Booths 60-62, 43-45, California Bldg.

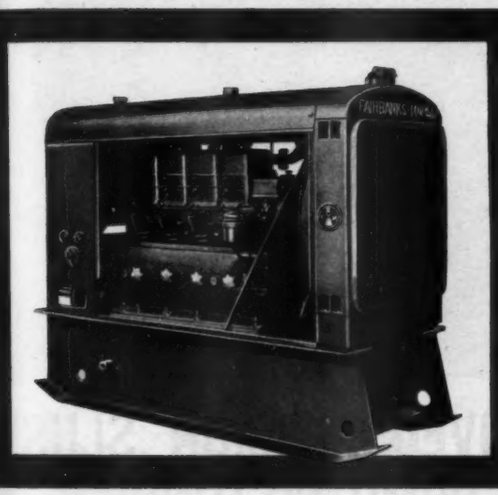
MACHINES—PIPE STRAIGHTENING

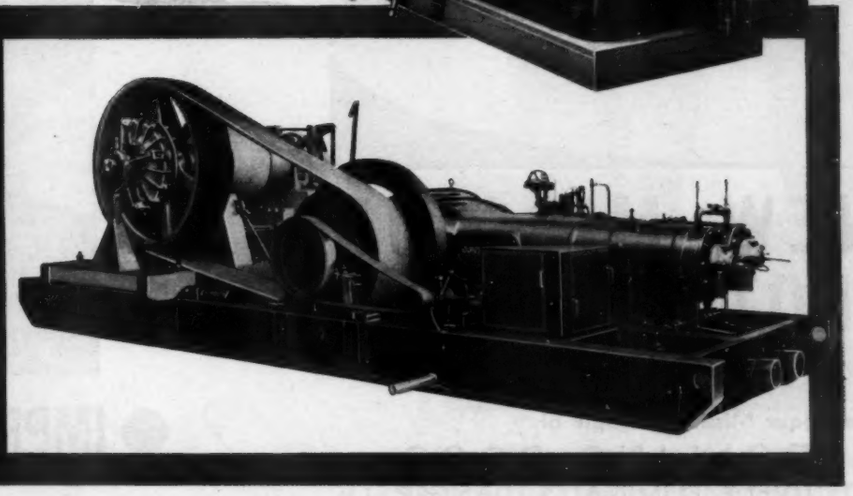
New Deal Specialty Co. ..... 11 Oklahoma Drive

Get the RIGHT engine for the Job

from the largest, most complete line of Diesels in America







● When you need a Diesel, where will you place the order? With the company that can offer engines that must be *adapted* to fit your requirements, or the company that has a complete line, one of which was *built* to do the job you require of it?

As the leading manufacturers of these engines, we have spent years of development not on one but on many Diesel types, each one specially designed to do a specific job. You will find their range running from 10 to 3300 hp. There are big 2-cycle Model 32s for pipe-line pumps, Model 47s for drilling, and lightweight Model 36s for easy transportation to inaccessible places.

When you plan power, play safe. Call the man from Fairbanks-Morse. He has a wider range of Diesel types and ratings from which to choose—and a wider background of experience in every field on which to base his recommendations. For full information on F-M Diesels, address Department H931, Fairbanks, Morse & Co., 900 S. Wabash Ave., Chicago, Ill. 34 branches at your service throughout the United States. Oil field distributor: Continental Supply Co., Tulsa, Oklahoma.

106 YEARS OF PRECISION MANUFACTURING

FAIRBANKS-MORSE

Diesel Engines

POWER PUMPING AND WEIGHING EQUIPMENT

WHY MISSION OIL MEN THE *Time, money*

● NEW MISSION ROTARY SLIPS

MODEL 36

The unique Mission principle of

ROLLING DOGS

POSITIVELY ELIMINATES DANGER OF SLIPS CUTTING OR CRUSHING PIPE . . . Insures against many costly fishing jobs.

. . . Saves pipe . . . Saves money.

BODY OF MISSION SLIPS PRACTICALLY INDISTRUCTIBLE . . . assures buyers practically a permanent investment.

DOGS QUICKLY AND EASILY REPLACED ON DERRICK FLOOR . . . Saves costly delays in taking slips to shop.

● IMPROVED MISSION SLUSH PUMP PISTONS

CUT UPKEEP COSTS IN HALF

REPLACEABLE RUBBERS ON A PERMANENT BODY . . . SAVE MONEY formerly invested in continuously buying new pistons.

PRINCIPLE OF MORE-RUBBER AND LESS-METAL gives three-times-greater wiping surface, eliminating by-passing . . . INCREASES LIFE of liners and pistons.

LIGHTEST WEIGHT PISTON ON THE MARKET . . . Eliminates drag.

DROP FORGED, CHROME NICKEL BODY, ONE-PIECE CONSTRUCTION . . . Resists any pressure.

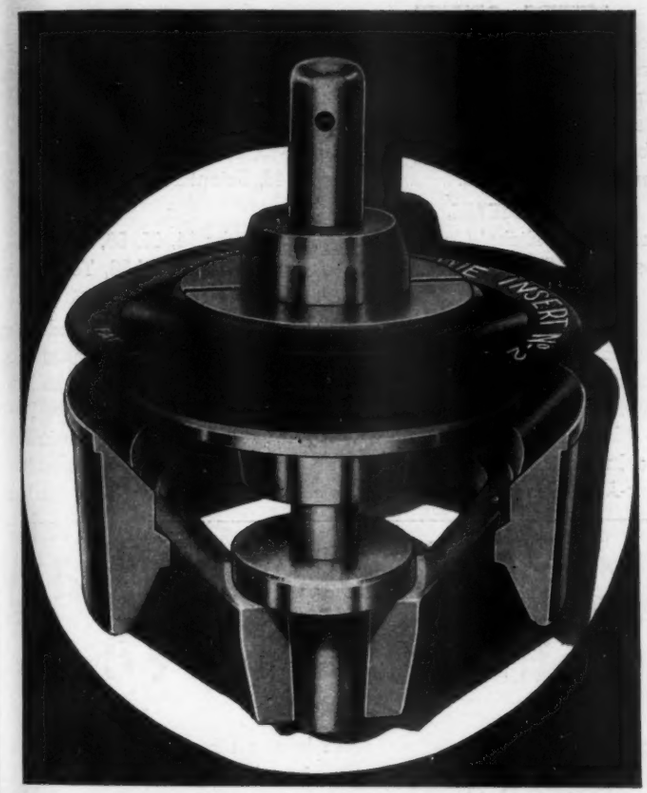
Sold by Supply Stores Everywhere

MAKING ECONOMY RECORDS *the* WORLD OVER

MIS MANUFA

HUMBLE ROAD

PRODUCTS SAVE WORLD OVER *and trouble*



NEW MISSION SILVER TOP VALVES

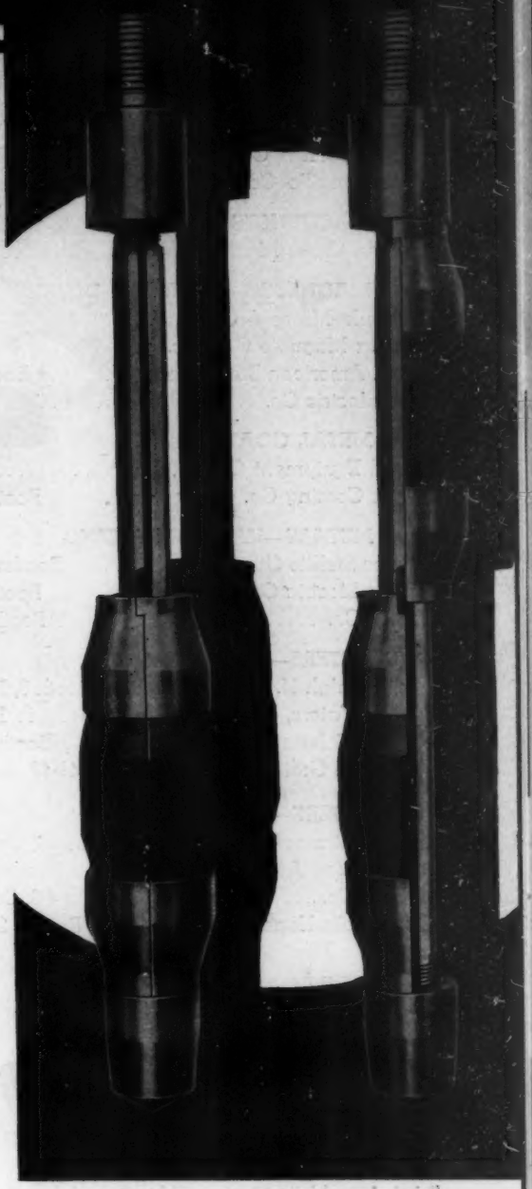
LAST 100% LONGER

SAVES MONEY formerly invested in buying new seats for conventional type valves.

SAVES LABOR continuously required for changing seats because of the TIME-PROVEN MISSION PRINCIPLE OF PERMANENT SEAT . . . WITH REPLACEABLE BUSHINGS that take the terrific blows that so quickly destroy the seats in conventional type valves.

BUSHING HELD FIRMLY IN PLACE . . . eliminating wear on valve seat under bushing and on bottom of bushing.

BUSHING EASILY CHANGED . . . by using attachment on Mission Seat Puller.



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Parrish Patents

FASTEST FALLING SWAB ON THE MARKET . . . Saves many hours of work in difficult swabbing jobs.

UNRESTRICTED, OPEN FLOW ON DOWN STROKE . . . eliminates a large proportion of the friction wear of rubbers against tubing.

Sold by Supply Stores Everywhere

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Scintilla Magneto Co., Inc. Booths 8-9, Oklahoma Bldg.
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Stoody Co. Booths 31-33, Oklahoma Bldg.

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Brodie, Ralph N. Co. Booth 8, Refiners & Marketers Bldg.
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Johnston & Jennings Co. Booths 82-129, Oklahoma Bldg.
Westcott & Greis, Inc. Booths 41-43, Scientific & Technical Bldg.

METERS—FLOW

Brown Instrument Co. Booths 39-64, Scientific & Technical Bldg.
Consolidated Ashcroft Hancock Co. Booths 8-9, Scien. & Tech. Bldg.
Foxboro Co. Booths 4-6, Scientific & Technical Bldg.
Minneapolis-Honeywell Reg. Co. Booths 39-64, Scien. & Tech. Bldg.
Tagliabue Mfg. Co., C. J. Booths 32-33, Scientific & Technical Bldg.
Taylor Instrument Companies Booths 35-36, Scien. & Tech. Bldg.
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American Meter Co., Inc. Booths 41, 42, 43, Scientific & Technical Bldg.
Merco-Nordstrom Valve Co. Booths 37-38, Scientific & Technical Bldg.
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Merco-Nordstrom Valve Co. Booths 37-38, Scien. & Tech. Bldg.
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International Nickel Co. Booths 64, 65, 66, Texas Bldg.
Steel Sales Corp. Booths 64-66, Texas Bldg.

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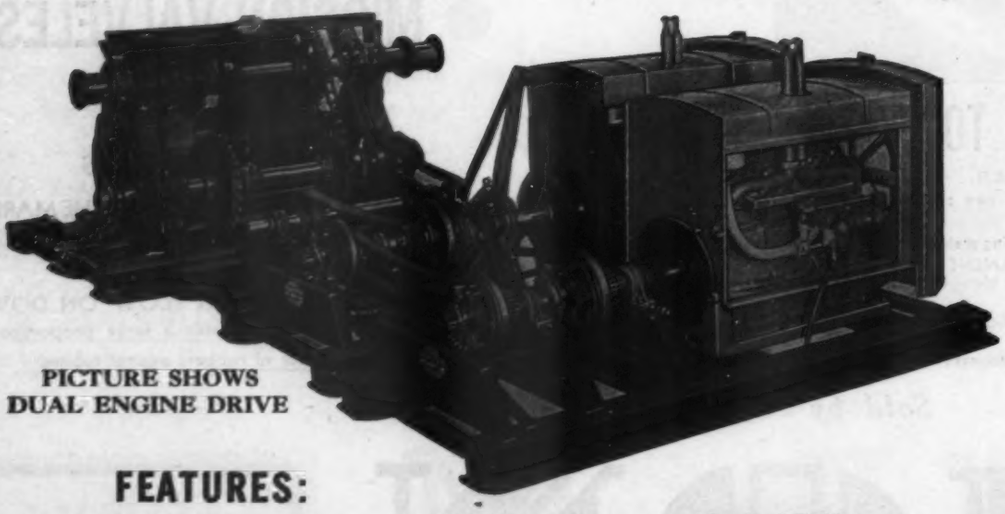

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For drilling three or four thousand foot wells with 4½" drill pipe, two engines are used of approximately 160 H.P. each. A third engine can be added, without changing any of the assembled units, for deeper drilling or when using 6" drill pipe. Adaptable for use with any Draw Works.

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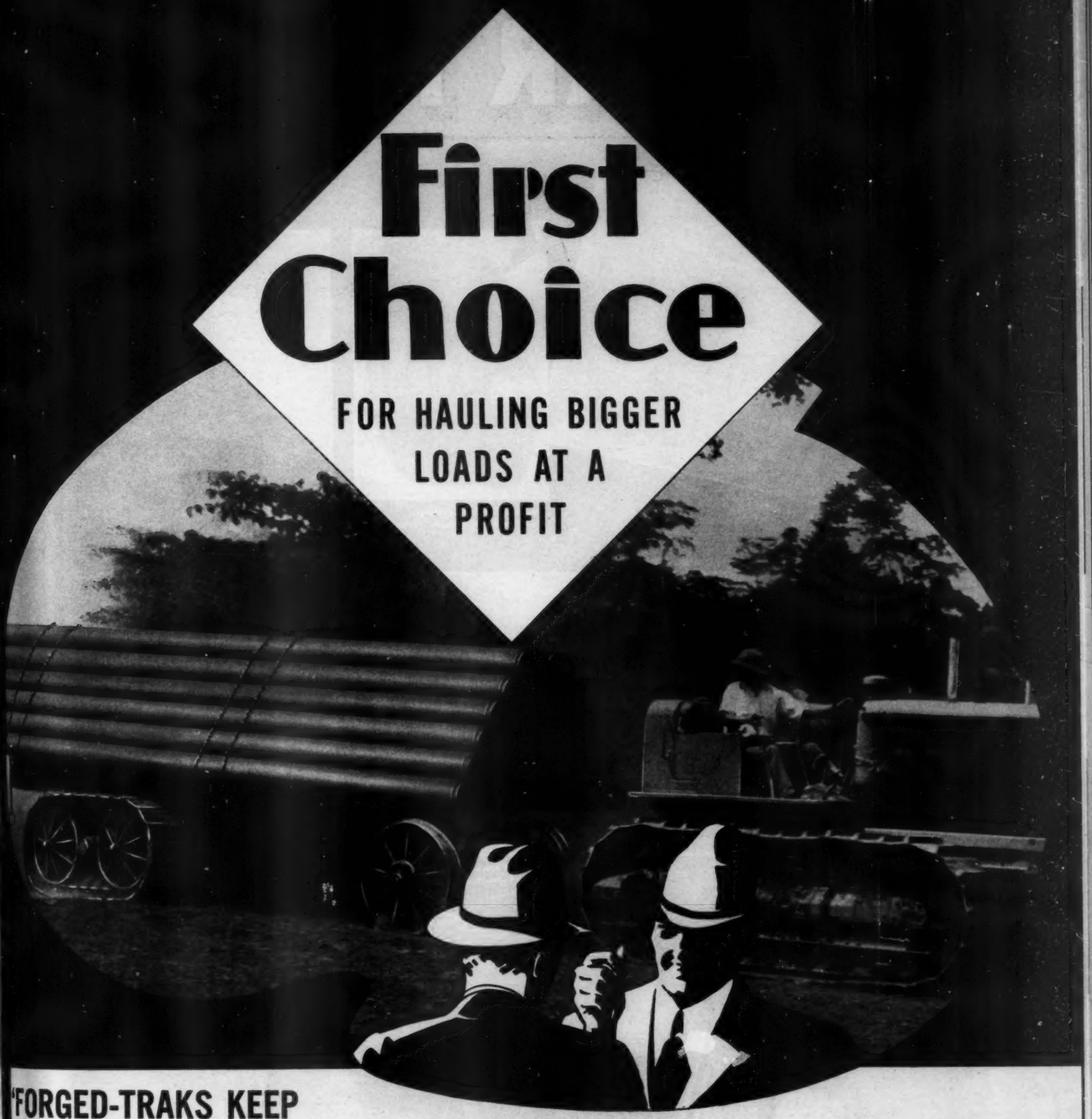

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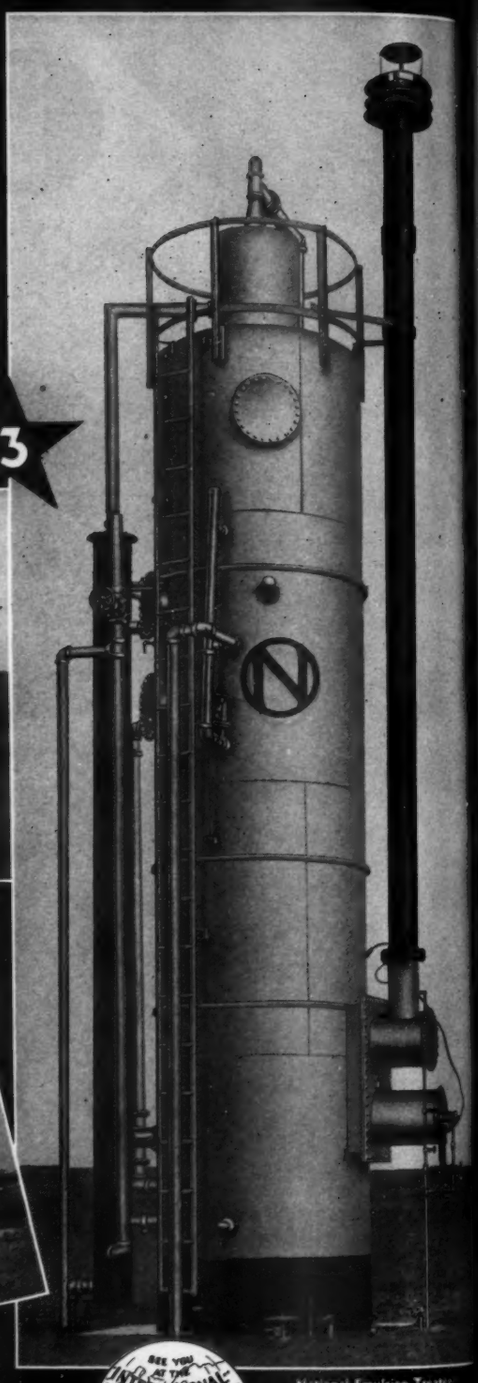

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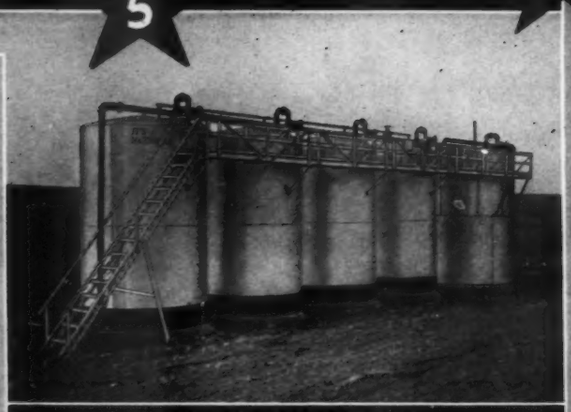
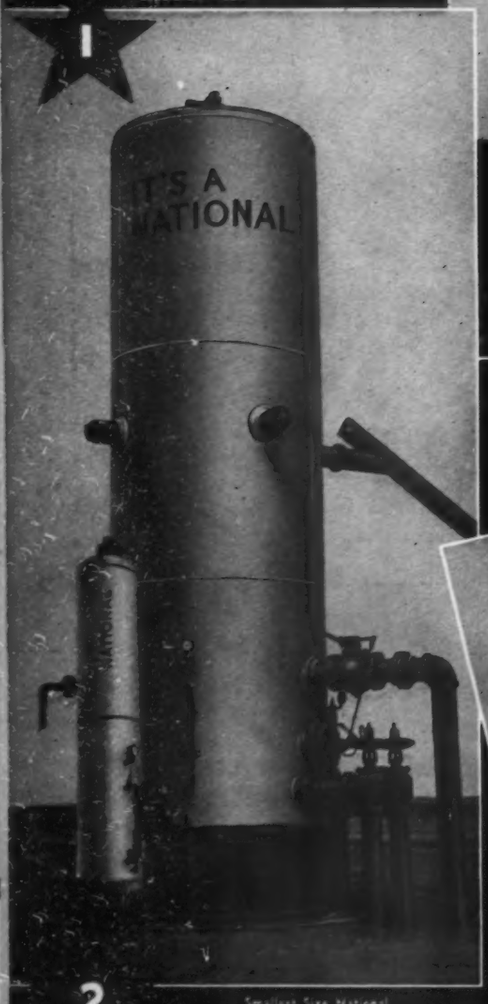


National Welded Oil Field Stock Tanks. Sizes 10 to 340 barrels capacity.

1

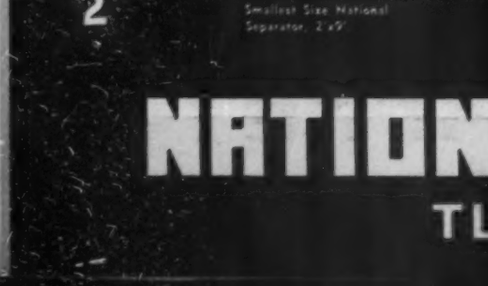


Largest Size National Separator. 7'x24'

6

National Wooden Oil Field Stock Tanks. For Water or Oil Storage.

2



Smallest Size National Separator. 2'x9'

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9th WORLD'S FAIR OF THE OIL INDUSTRY TULSA, U.S.A. MAY 16 23

NATIONAL TANK COMPANY

TULSA, OKLAHOMA.– U.S.A.

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Standard or Low Pressure Types National Oil and Gas Separators. Designed for general flow requirements. Sizes and capacities for any production requirement, for large or small wells. Most sizes may be furnished in regular or dual control equipment. Standard sizes include the following:

Size	Wkg. Press.	*Oil Capac.	*Gas Capac.
30″ x 10′	125 lbs.	5,000 bbls.	5,000,000 cu. ft.
36″ x 11′	125 lbs.	8,000 bbls.	8,000,000 cu. ft.
36″ x 15′	125 lbs.	10,000 bbls.	15,000,000 cu. ft.
48″ x 12½′	125 lbs.	12,000 bbls.	15,000,000 cu. ft.
48″ x 16½′	125 lbs.	18,000 bbls.	20,000,000 cu. ft.
60″ x 16½′	100 lbs.	25,000 bbls.	40,000,000 cu. ft.
60″ x 16½′	150 lbs.	30,000 bbls.	50,000,000 cu. ft.
84″ x 24′	125 lbs.	100,000 bbls.	150,000,000 cu. ft.

High Pressure and Extra High Pressure Types. All sizes constructed strictly according to API-ASME Code requirements. All vessels thermal stress relieved. Regular equipment includes National AIC Liquid Level Control. Standard sizes include the following:

Size	Nominal Wkg. Press.	*Oil Capacity	*Gas Capacity
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24″ x 9′	1000 lbs.	2,000 bbls.	7,000,000 cu. ft.
24″ x 9′	1500 lbs.	2,300 bbls.	8,000,000 cu. ft.
24″ x 9′	3000 lbs.	2,500 bbls.	10,000,000 cu. ft.
24″ x 18′	1000 lbs.	3,000 bbls.	16,000,000 cu. ft.
24″ x 18′	1500 lbs.	3,200 bbls.	16,000,000 cu. ft.
24″ x 18′	3000 lbs.	3,500 bbls.	16,000,000 cu. ft.
30″ x 13′	300 lbs.	2,500 bbls.	13,000,000 cu. ft.
30″ x 13′	500 lbs.	3,500 bbls.	18,000,000 cu. ft.
30″ x 13′	1000 lbs.	4,000 bbls.	20,000,000 cu. ft.
30″ x 18′	500 lbs.	5,000 bbls.	27,000,000 cu. ft.
30″ x 18′	1000 lbs.	5,000 bbls.	30,000,000 cu. ft.
36″ x 16½′	500 lbs.	6,000 bbls.	35,000,000 cu, ft.
48″ x 12½′	250 lbs.	15,000 bbls.	30,000,000 cu. ft.

*Capacities given are general and may vary with different working conditions such as gas-oil ratios, methods of hook-ups, etc. Capacities listed are actual field ratings under average working conditions and may be exceeded in many cases.

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MADE IN SIZES TO SUIT REQUIREMENTS. CAPACITY 25 TO 2500 BARRELS PER DAY FOR EACH UNIT.

GUARANTEE—"After sample of true emulsion has been submitted and tested and maximum requirements for unit is known and our recommendations followed, we guarantee to treat oil—to less than .5 of 1% free water and to less than .2 of 1% B.S., or to less than .5 of 1% B.S. and Water; To deliver oil to tanks at stable temperature; To deliver oil to tanks at approximately well gravity before well produced emulsion; To secure at least 65% efficiency for cubic feet of gas required for heating; To use as little or less chemical than any other known process; To treat the oil without the necessity of a settling tank before the stock tanks; To treat heading wells without a separator ahead of the treater when gas volumes are not too great; To handle the production automatically as far as heat control and gas, water and oil discharge; To treat under pressure or vacuum."

SOME NATIONAL EMULSION FEATURES—From Atmospheric to 50 lbs. psi. operating pressure. Removable Firebox. Automatic Temperature Control and Thermometer. Separable Socket Wells for Temp. Control and Thermometer. Heat Exchanger for Cooling Oil going to Tanks. Separator for oil and gas (built into the unit). Surge Chamber for Heading Wells. The satisfaction of a complete job within one vessel.

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With five important exclusively National improvements. Sizes 65 to 10,000-barrel capacity. API specification.

Made in—Steel—Galvanized Steel—Wrought Iron—Galvanized Wrought Iron.

All galvanizing applied after complete fabrication.

Galvanized Steel Tanks require no painting and have long life in sour oils.

Wrought Iron Tanks have unusual life in sour oils.

Galvanized Wrought Iron Tanks have longest life in sour oils.

NATIONAL PORTABLE WELDED STEEL STOCK TANKS

Sizes 10 to 340 barrels. All improved designs.

Double welded by shielded arc process.

Stock Tanks and Flow Tanks made to any design required and from any thickness steel.

Give many years service in sour oils and are practically everlasting in sweet oils.

All tanks tested, free from leaks—no oil losses.

NATIONAL WOODEN OIL FIELD STOCK TANKS

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Made of all clear heart redwood (There's a good reason).
Use for settling tanks.
No water on the deck.
May be supplied with unique baffle system, Outside Boot or Flume.

For Stock Tank use—
No water on the deck,
The new improved tank that requires no water on top,
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Fire hazard from oil on top of the sun deck eliminated,
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The Coupling that never leaks.
Sizes 2″ to 8″ for all types of oil field work.
For Vacuum or Pressure Lines.
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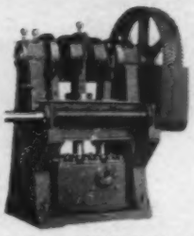
FOR THE BEST DRINKING WATER ALWAYS HANDY



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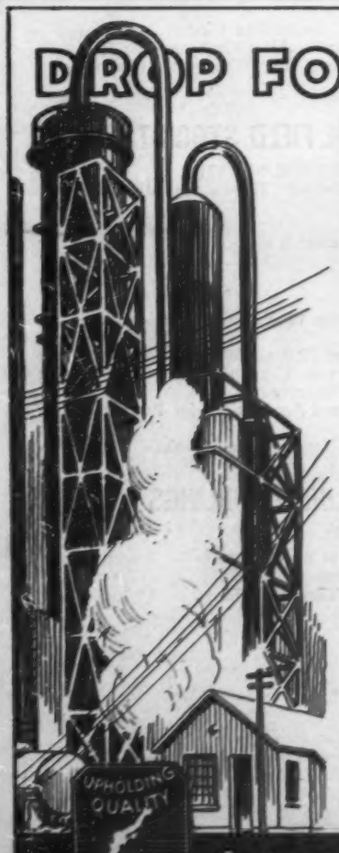

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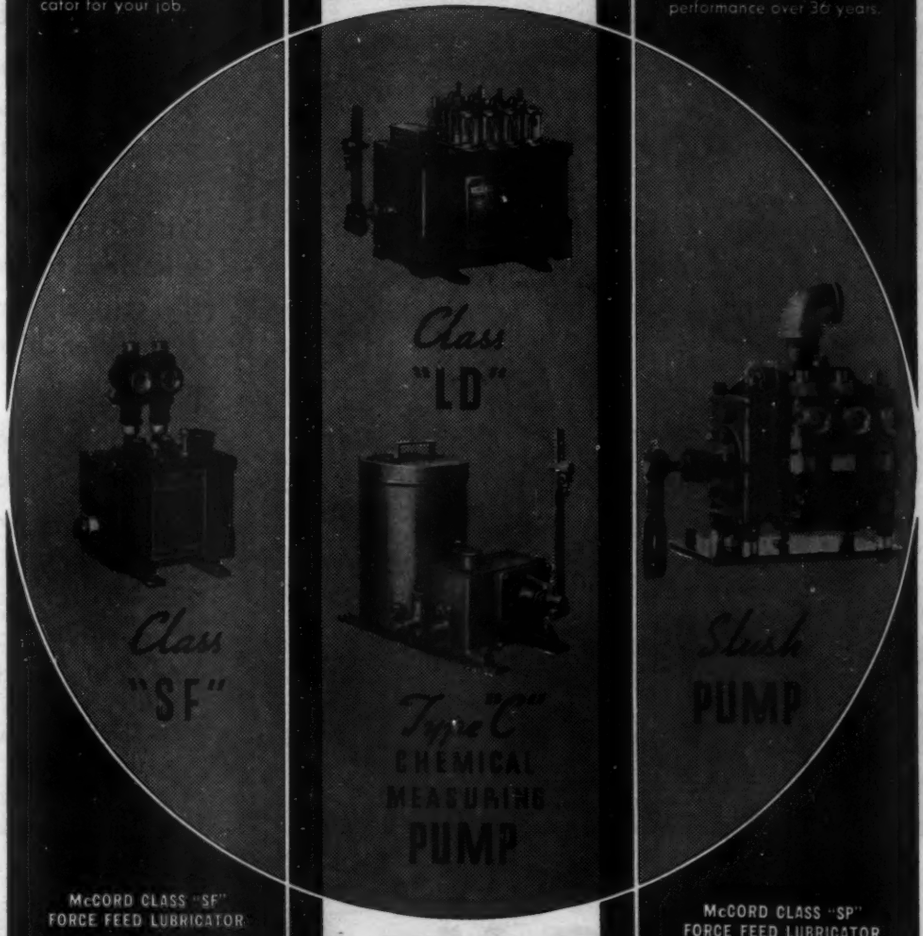

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Bridgeport Machine Co. ..... 6 Drake Drive
International Derrick & Equipment Co. ..... 10 Drake Drive
Moore & Co., Lee C. ..... Booths 65-66, Oklahoma Bldg.
Muskogee Iron Works ..... 9 Skelly Drive
O. C. S. Mfg. Co. ..... Booths 10-11, Okla. Bldg., 1 Skelly Drive
Parkersburg Rig & Reel Co. .. Booths 74-75, Texas Bldg., 12 Drake Drive

PIPE—DRILL

Bridgeport Machine Co. ..... 6 Drake Drive
Continental Supply Co. ..... 2 Drake Drive
Frick-Reid Supply Corp. ..... 1 Drake Drive
Hydril Co. ..... Booths A-B, Outside Texas Bldg.
International Supply Co. ..... 6 Beeville Lane
Jarecki Mfg. Co. ..... Booths 79-132, Texas Bldg.
Jones & Laughlin Steel Corp. .... Booths 12, 13, 14, 15, 16, Okla. Bldg.
Murray Tool & Supply Co. ..... Booths A-B, Outside Texas Bldg.
National Supply Co. ..... 5 Drake Drive
National Tube Co. ..... Booths 93 to 118 incl., Oklahoma Bldg.
Norvell-Wilder Supply Co. ..... 3 Skelly Drive
Oil Well Supply Co. ..... 3 Drake Drive
Pittsburgh Steel Co. ..... Booths 4, 5, 6, Texas Bldg.
Republic Steel Corp. ..... Booths 16-21, Texas Bldg.
Republic Supply Co. ..... Booths 16-21, Texas Bldg.
Spang, Chalfant & Co. ..... Booths 44-45, Texas Bldg.
Youngstown Sheet & Tube Co. ..... 2 Drake Drive

PIPE—LINE

American Rolling Mill Co. ..... Booths 70-71, Oklahoma Bldg.
Bridgeport Machine Co. ..... 6 Drake Drive
Clayton Mark & Co. ..... Booth 64, California Bldg.
Continental Supply Co. ..... 2 Drake Drive
Frick-Reid Supply Corp. ..... 1 Drake Drive
International Supply Co. ..... 6 Beeville Lane
Jarecki Mfg. Co. ..... Booths 79-132, Texas Bldg.
Jones & Laughlin Steel Corp. .... Booths 12, 13, 14, 15, 16, Okla. Bldg.
Lucey Products Corp. ..... 8 Oil City Way
Murray Tool & Supply Co. ..... Booths A-B, Outside Texas Bldg.
National Supply Co. ..... 5 Drake Drive
National Tube Co. ..... Booths 93 to 118 incl., Oklahoma Bldg.
Norvell-Wilder Supply Co. ..... 3 Skelly Drive
Oil Well Supply Co. ..... 3 Drake Drive
Pittsburgh Steel Co. ..... Booths 4, 5, 6, Texas Bldg.
Republic Steel Corp. ..... Booths 16, 17, 18, 19, 20, 21, Texas Bldg.
Republic Supply Co. ..... Booths 16, 17, 18, 19, 20, 21, Texas Bldg.
Scully Steel Products Co. ..... Booths 93 to 118 incl., Oklahoma Bldg.
Smith Corp., A. O. ..... Booths 87-88, Oklahoma Bldg.
Spang, Chalfant & Co. ..... Booths 44-45, Texas Bldg.
Taylor Forge & Pipe Works ..... Booth 84, Oklahoma Bldg.
Western Metal Mfg. Co. ..... Booths 70-71, Oklahoma Bldg.
Wheeling Steel Corp. ..... 7 Arcade Way
Youngstown Sheet & Tube Co. .. Booths 1, 2, 3, 4, Continental Supply

PISTONS

Baash-Ross Tool Co. ..... Booth 69, Texas Bldg.
Beaumont Iron Works Co. ..... 1 Drake Drive
Bridgeport Machine Co. ..... 6 Drake Drive
Byron Jackson Co. ..... Booths 25-28, Oklahoma Bldg.
Failing Supply Co., Geo. E. ..... 5 Oil City Way
Lucey Products Corp. ..... 8 Oil City Way
MacClatchie Mfg. Co. ..... 2 Drake Drive
Mission Mfg. Co. ..... Booths 119-120, Texas Bldg.

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Hughes Tool Co. ..... Booths 91, 92, 93, Texas Bldg.

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For 40 years SPANG AND COMPANY have been leaders in solving Cable Tool Drilling problems.

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This equipment, with other SPANG Quality Tools, will be shown at the SPANG Booth in the California Building of the International Petroleum Exposition.

Officers and sales representatives of SPANG AND COMPANY will be there and will be glad to meet you.

SPANG PERSONNEL—Top, left to right: Loyal B. Spang, Vice President; Ferd J. Spang, President; C. Everette Spang, Vice President. *Bottom, left to right:* E. B. Irvan, in charge of Michigan sales; George A. Liddердale, manager of Michigan Branch; Olin B. Pierce, in charge of Texas sales; Lewis F. Porter, in charge of Kansas sales; C. J. Turner, in charge of Eastern sales.

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District Office
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CASING TUBING
LINE PIPE
Pittsburgh
Seamless
CASING TUBING
DRILL PIPE
HOUSTON
District Office
Corpus Christi

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TINENT AND GULF COAST

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When the Taubman Supply Corporation was founded in 1920 we concentrated our efforts on the buying and selling of Dependable Used Tubular Products. Shortly after the inception of our Company, the Oil and Gas Fraternity responded so wholeheartedly to the TAUBMAN Policy of doing business, we found it necessary to add New Tubular Products to supply our customers' demands.

Today, although we are employing over a Million Dollars in the Used Material Division, it is only a "Service Unit" in our organization, the majority of our business being the distribution of new pipe. We carry comprehensive stocks of Republic Electricweld and Pittsburgh Seamless at our various branches.

Our faith in the Industry and our obligation to our loyal friends and customers is exemplified by the fact that today TAUBMAN SERVICE is available in every active Mid-Continent field from Kansas to the Gulf Coast and South Texas.

Serving the Gulf Coast and surrounding territory, our Plant at Houston, when completed, will be one of the most modern equipped pipe machine shops and yards of its kind.

With the opening of our new Branch at Corpus Christi, Texas, we have ten Branches, seven of which are equipped with the latest Landis Pipe Threading machines handling Grade "C" and Grade "D" pipe, A.P.I. and standard threads from 1" to 20" inclusive, depending upon the maximum size required for each District.

The TAUBMAN personnel is trained to expertly serve the Oil and Gas Industry for its various needs, Tubular Products for all purposes being our specialty.

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METALLIC
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FOR
RECIPROCATING
RODS

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TEXAS
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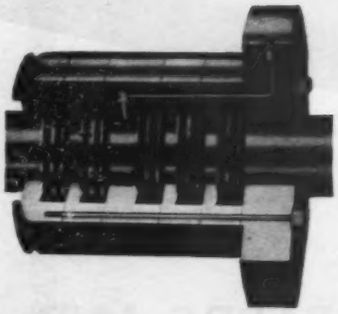

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POWERS—BANDWHEEL & GEARED

Continental Supply Co.	2 Drake Drive
Falk Corp.	2 Drake Drive
Frick-Reid Supply Corp.	1 Drake Drive
International Derrick & Equipment Co.	10 Drake Drive
Lufkin Foundry & Machine Co.	5 Skelly Drive
Moore & Co., Lee C.	Booths 65-66, Oklahoma Bldg.
Muskogee Iron Works	9 Skelly Drive
National Supply Co.	5 Drake Drive
Oil Well Supply Co.	3 Drake Drive
Parkersburg Rig & Reel Co.	Booths 74-75, Texas Bldg., 12 Drake Drive
Reid Gas Engine Co., Jos.	1 Drake Drive
Titusville Iron Works Co.	6 Beeville Lane

PREVENTERS—BLOWOUT

Baash-Ross Tool Co.	Booth 69, Texas Bldg.
Cameron Iron Works, Inc.	7 Pennsylvania Ave.
Hercules Tool Co.	Booths 55-56, Texas Bldg.
Hinderliter Tool Co.	Booths 22, 23, 24, Texas Bldg.
Hughes Tool Co.	Booths 91-93, Texas Bldg.
Hydril Co.	Booths A-B, Outside Texas Bldg.
Kerotest Mfg. Co.	Booths 89-122, Oklahoma Bldg.
Lucey Products Corp.	8 Oil City Way
MacClatchie Mfg. Co.	2 Drake Drive

PULLEYS

American Steel Derrick Co.	8 Drake Drive
Dayton Rubber Mfg. Co.	Booths 14-15, California Bldg.
Dodge Mfg. Co.	Booths 4-5, California Bldg.
Link-Belt Co.	Booths 61-63, Texas Bldg.
Moore & Co., Lee C.	Booths 65-66, Oklahoma Bldg.
O. C. S. Mfg. Co.	Booths 10-11, Okla. Bldg., 1 Skelly Drive
Parkersburg Rig & Reel Co.	Booths 74-75, Texas Bldg., 12 Drake Drive
Weber Engine Co.	7 Arcade Way
Western Iron & Foundry Co.	Booth 17, California Bldg.

PULLING MACHINES—OIL WELL

Allis-Chalmers Mfg. Co.	15 Arcade Way
Allsteel Products Mfg. Co.	9 Arcade Way
Cooper, Fred E.	15 Arcade Way
Franks Mfg. Co.	3 Arcade Way
Hydril Co.	Booths A-B, Outside Texas Bldg.
Moore & Co., Lee C.	Booths 65-66, Oklahoma Bldg.
Muskogee Iron Works	9 Skelly Drive
Star Drilling Machine Co.	Booths 48-49, Ref. & Mark. Bldg.
Wilson Mfg. Co.	8 Oklahoma City Ave.

PUMPING EQUIPMENT—BACKSIDE & SURFACE

Bovaird Supply Co.	Booths 25-27, Texas Bldg.
Continental Supply Co.	2 Drake Drive
Lufkin Foundry & Machine Co.	15 Skelly Drive
National Supply Co.	5 Drake Drive
Norris Manufacturer, Inc., W. C.	Booth 8 Arcade; 11 Arcade Way
Oil Well Supply Co.	3 Drake Drive
Surface Equipment Co.	6 Texas Drive

PUMPING EQUIPMENT—ELECTRICAL SUBMERGIBLE

Reda Pump Co.	5 Seminole St.

PUMPS—CHEMICAL

Hills-McCanna Co.	Booth 1, California Bldg.
Manzel Bros. Co.	Booth 50, Oklahoma Bldg.
McCord Radiator & Mfg. Co.	Booths 72-73, Oklahoma Bldg.

PUMPS—OIL WELL

Axelson Mfg. Co.	1 Drake Drive
Bovaird Supply Co.	Booths 25, 26, 27, Texas Bldg.
Byron Jackson Co.	Booths 25-28, Oklahoma Bldg.
Hough Mfg. Co., Chas. N.	Booths 123-124, Texas Bldg.
Mid-Continent Pump Supply Co.	Booths 25, 26, 27, Texas Bldg.
O'Bannon Co., Walter	Booth 104, Texas Bldg.
Pacific Pump Works	Booths 25, 26, 27, Texas Bldg.
Reda Pump Co.	5 Seminole St.
Thompson Pump Co.	Booth 48, California Bldg.
Worthington Pump & Machinery Corp.	4 Skelly Drive

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SEE, and get full details about COOK'S GRAPHITIC IRON Piston Rings—the choice of leading operators everywhere and of many engine and compressor manufacturers because COOK'S Rings have longer life, substantially reduce cylinder wear, and cut maintenance and operating costs way down. Along with COOK'S Plain Rings there will be exhibited—COOK-TITE Sealing Rings—COOK'S Oil Control Rings—and COOK'S Segmental Rings. If you are not going to the Show, write for descriptive bulletin.

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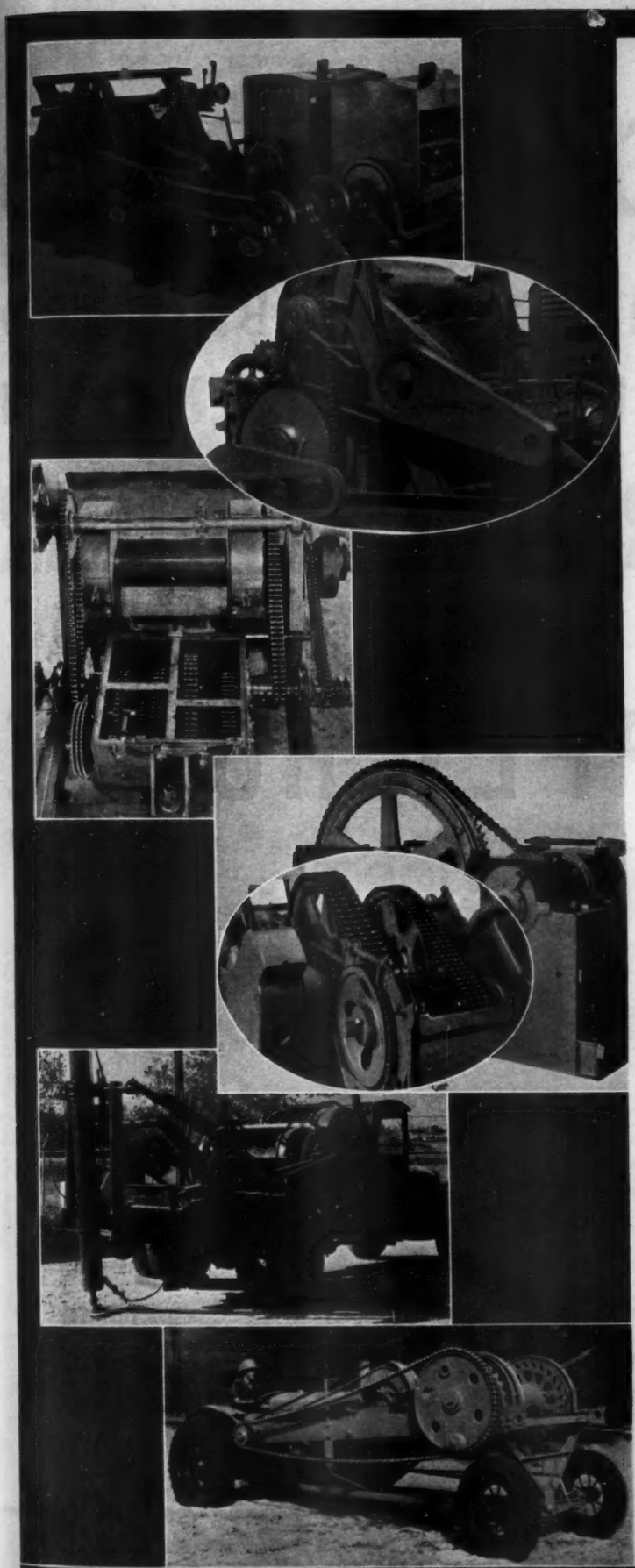

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PUMPS—PIPE LINE

Allis-Chalmers Mfg. Co.	2 Oil City Way, 15 Arcade Way
Fairbanks-Morse & Co.	2 Drake Drive
Gardner-Denver Co.	2 Drake Drive
Gaso Pump & Burner Mfg. Co.	Booths 57-58, Texas Bldg.
Gorman-Rupp Co.	12 Skelly Drive
Ingersoll-Rand Co.	2 Tyler St.
National Supply Co.	5 Drake Drive
National Transit Pump & Machine Co.	1 Drake Drive
Oil Well Supply Co.	3 Drake Drive
Wheatley Bros. Pump & Valve Mfg. Co.	5 Signall Hill St.
Worthington Pump & Machinery Corp.	4 Skelly Drive

PUMPS—REFINERY

Allis-Chalmers Mfg. Co.	2 Oil City Way, 15 Arcade Way
Byron Jackson Co.	Booth 25, 26, 27, 28, Oklahoma Bldg.
Frick-Reid Supply Corp.	1 Drake Drive
Gardner-Denver Co.	2 Drake Drive
Ingersoll-Rand Co.	2 Tyler St.
McGregor Engineering Co.	Booth 24, Oklahoma Bldg.
National Supply Co.	5 Drake Drive
National Transit Pump & Machine Co.	1 Drake Drive
Worthington Pump & Machinery Corp.	4 Skelly Drive

PUMPS—SAND

Larkin Packer Co.	Booths 80-81, Oklahoma Bldg.
Miller Sand Pump Co.	10 Oil City Way
Spang & Co.	Booths 47-58, California Bldg.

PUMPS—SLUDGE

National Transit Pump & Machine Co.	1 Drake Drive
Sludge Pumping, Inc.	4 Skelly Drive

PUMPS—SLUSH

Fairbanks-Morse & Co.	2 Drake Drive
Gardner-Denver Co.	2 Drake Drive
Ingersoll-Rand Co.	2 Tyler St.
Lucey Products Corp.	8 Oil City Way
Mission Mfg. Co.	Booths 119-120, Texas Bldg.
National Supply Co.	5 Drake Drive
National Transit Pump & Machine Co.	1 Drake Drive
Oil Well Supply Co.	3 Drake Drive
Titusville Iron Works Co.	6 Beeville Lane
Wheland Co., The	8 Oil City Way
Worthington Pump & Machinery Corp.	4 Skelly Drive

PURIFICATION—WATER & BRINE

International Filter Co.	Booth 14, Scientific & Technical Bldg.

PYROMETERS

Bristol Co.	Booths 1-2, Scientific & Technical Bldg.
Brown Instrument Co.	Booths 39-64, Scientific & Technical Bldg.
Foxboro Co.	Booths 4-6, Scientific & Technical Bldg.
Leeds & Northrup Co.	Booths 29-30, Scientific & Technical Bldg.
Tagliabue Mfg. Co., C. J.	Booths 32-33, Scien. & Tech. Bldg.
Taylor Instrument Companies	Booths 35-36, Scien. & Tech. Bldg.
Westcott & Greis, Inc.	Booths 41-43, Scientific & Technical Bldg.

RACKS—CAN DISPLAY

American Can Co.	Booths 45-60, Refiners & Marketers Bldg.

REAMERS

Baash-Ross Tool Co.	Booth 69, Texas Bldg.
Bridgeport Machine Co.	6 Drake Drive
Chiksan Oil Tool Co., Ltd.	Booths 25-26, Ref. & Mark. Bldg.
Hughes Tool Co.	Booths 91-93, Texas Bldg.
Lucey Products Corp.	8 Oil City Way
MacClatchie Mfg. Co.	2 Drake Drive
Reed Roller Bit Co.	Booths 12, 13, 14, Texas Bldg.
Spang & Co.	Booths 47-58, California Bldg.

REFINERY ENGINEERS

Black, Sivalls & Bryson, Inc.	Booths 39-66, California Bldg.
Frick-Reid Supply Corp.	1 Drake Drive
Foster-Wheeler Corp.	3 Drake Drive

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National Supply Co. ..... 5 Drake Drive
Tulsa Boiler & Machinery Co. ..... 3 California Ave—Outside

REFRACTORIES

Atlas Supply Co. ..... 7 Arcade Way
Green, A. P., Fire Brick Co. .... Booth 56, Scientific & Technical Bldg.
Johns-Manville Corp. ..... Booth 87, Texas Bldg.
Plibrico Jointless Firebrick Co. ... Booth 4, Refiners & Marketers Bldg.
Quigley Co., Inc. ..... Booths 61-62, Refiners & Marketers Bldg.
Royall Fire Brick & Supply Co. . Booth 56, Scientific & Technical Bldg.

REFRIGERATING MACHINERY

Cooper-Bessemer Corp. ..... 8 Skelly Drive
Frick Co., Inc. ..... Booths 42-63, California Bldg.
Ingersoll-Rand Co. ..... 2 Tyler St.
Vogt Machine Co., Henry ..... Booth 128, Oklahoma Bldg.
Worthington Pump & Machinery Corp. ..... 4 Skelly Drive

REGULATORS—BACK PRESSURE

American Meter Co. ..... Booths 41-43, Scientific & Technical Bldg.
Chaplin-Fulton Mfg. Co. ..... Booth 40, Scientific & Technical Bldg.
Consolidated Ashcroft Hancock Co. . Booths 8-9, Scien. & Tech. Bldg.
Davis Regulator Co. ..... Booths 41-43, Scientific & Technical Bldg.
Fisher Governor Co. ..... Booth 89, Texas Bldg.
Foxboro Co. ..... Booths 4-6, Scientific & Technical Bldg.
Hanlon-Waters, Inc. ..... Booths 83-128, Texas Bldg.
Mason-Neilan Regulator Co. ..... Booths 14-15, Arcade
Moorlane Co. ..... Booth 83, Oklahoma Bldg.
Pittsburgh Equitable Meter Co. ..... 6 Arcade Way
Sonner Burner Co. .... Booth 58, Oklahoma Bldg., 9 Oklahoma Drive
Webster Engineering Co. ..... Booths 22-23, Oklahoma Bldg.
Westcott & Greis, Inc. ..... Booths 41-43, Scientific & Technical Bldg.
Young Engine Corp. ..... 5 Texas Drive

REGULATORS—GAS

Acme Regulator Co. ..... 12 Oil City Way
American Meter Co. ..... Booths 41-43, Scientific & Technical Bldg.
Brown Instrument Co. ..... Booths 36-64, Scientific & Technical Bldg.
Chaplin-Fulton Mfg. Co. ..... Booth 40, Scientific & Technical Bldg.
Fisher Governor Co. ..... Booth 89, Texas Bldg.
Mason-Neilan Regulator Co. ..... Booths 14-15, Arcade
Midwest Equitable Meter Co. ..... Booths 37-38, Scien. & Tech. Bldg.
Moorlane Co. ..... Booth 83, Oklahoma Bldg.
Natural Gas Equipment Co. . Booths 22-23, Okla. Bldg., 8 Oil City Way
Pittsburgh Equitable Meter Co. ..... 6 Arcade Way
Reliance Regulator Co. .... Booths 41-43, Scientific & Technical Bldg.
Smith Separator Co. ..... Booths 90, 121, 122, Texas Bldg.
Sonner Burner Co. .... Booth 58, Oklahoma Bldg., 9 Oklahoma Drive
Webster Engineering Co. ..... Booths 22-23, Oklahoma Bldg.
Westcott & Greis, Inc. ..... Booths 41-43, Scientific & Technical Bldg.
Young Engine Corp. ..... 5 Texas Drive

REGULATORS—LIQUID LEVEL

Brown Instrument Co. ..... Booths 39-64, Scientific & Technical Bldg.
Chaplin-Fulton Mfg. Co. ..... Booth 40, Scientific & Technical Bldg.
Consolidated Ashcroft Hancock Co. . Booth 8-9, Scien. & Tech. Bldg.
Fisher Governor Co. ..... Booth 89, Texas Bldg.
Foxboro Co. ..... Booths 4-6, Scientific & Technical Bldg.
Leeds & Northrup Co. ..... Booths 29-30, Scientific & Technical Bldg.
Mason-Neilan Regulator Co. ..... Booth 14-15, Arcade
Moorlane Co. ..... Booth 83, Oklahoma Bldg.
Webster Engineering Co. ..... Booths 22-23, Oklahoma Bldg.
Westinghouse Electric & Mfg. Co. .... Booths 91-120, Oklahoma Bldg.

RETURN—BENDS

Crane Co. ..... Booths 50-55, Refiners & Marketers Bldg.
Jarecki Mfg. Co. ..... Booths 79-132, Texas Bldg.
Key Co. ..... Booths 65-66, Refiners & Marketers Bldg.
Kerotest Mfg. Co. ..... Booths 89-122, Oklahoma Bldg.
Midwest Piping & Supply Co. ..... 1 Drake Drive
Moorlane Co. ..... Booth 83, Oklahoma Bldg.
Ohio Steel Foundry Co. ..... Booths 76-77, Texas Bldg.
Reading, Pratt & Cady Co., Inc. ..... Booth 85, Oklahoma Bldg.
Sivyer Steel Co. ..... Booths 70-71, Texas Bldg.
Walworth Co. ..... Booths 104-107, Oklahoma Bldg.

RIG FRONTS

American Steel Derrick Co. ..... 8 Drake Drive
Emsco Derrick & Equipment Co. ..... 2 Drake Drive
International Derrick & Equipment Co. ..... 10 Drake Drive
Moore & Co., Lee C. ..... Booths 65-66, Oklahoma Bldg.
Muskogee Iron Works, Inc. ..... 9 Skelly Drive
O. C. S. Mfg. Co. ..... Booths 10-11, Oklahoma Bldg., 1 Skelly Drive
Parkersburg Rig & Reel Co. . Booths 74-75, Texas Bldg., 12 Drake Drive
Shaffer Specialty Co. ..... 7 Oklahoma Drive
Western Iron & Foundry Co. ..... Booth 17, California Bldg.

RINGS—PISTON

American Hammered Piston Ring Co. .... Booths 126-85, Texas Bldg.
Big Four Foundry Co. ..... 2 West Virginia Ave.
Cook, C. Lee, Mfg. Co. ..... Booth 51, Texas Bldg.
Cooper-Bessemer Corp. ..... 8 Skelly Drive
Portable Rig Co. ..... 3 West Virginia Ave.
Sealed Power Corp. ..... Booth 21, Refiners & Marketers Bldg.
Woobank Pump & Machinery Co. ..... Booth 51, Texas Bldg.

RINGS—TOWER PACKING

National Carbon Co. ..... Booth 64, California Bldg.

RODS—PISTON

Byron Jackson Co. ..... Booths 25-28, Oklahoma Bldg.
Carson Machine & Supply Co. ..... Booth 46, California Bldg.
MacClatchie Mfg. Co. ..... 2 Drake Drive
Mission Mfg. Co. ..... Booths 119-120, Texas Bldg.

RODS—PULL

Axelson Mfg. Co. ..... 1 Drake Drive
Bridgeport Machine Co. ..... 6 Drake Drive
D. & B. Pump & Supply Co. .... Booths 7-8, Continental Supply Bldg.
Emsco Derrick & Equipment Co. ..... 2 Drake Drive
Lucey Products Corp. ..... 8 Oil City Way

RODS—SUCKER

Axelson Mfg. Co. ..... 1 Drake Drive
Bridgeport Machine Co. ..... 6 Drake Drive
D. & B. Pump & Supply Co. .... Booths 7-8, Continental Supply Bldg.
Emsco Derrick & Equipment Co. ..... 2 Drake Drive
Frick-Reid Supply Corp. ..... 1 Drake Drive
Jarecki Mfg. Co. ..... Booths 79-132, Texas Bldg.
Jones Co., S. M. ..... Booths 18-19, Oklahoma Bldg.
Lucey Products Corp. ..... 8 Oil City Way
National Supply Co. ..... 5 Drake Drive
Norris, W. C., Manufacturer, Inc. .... Booth 8, Arcade; 11 Arcade Way
Oil Well Supply Co. ..... 3 Drake Drive
Timken Steel & Tube Co. ... Booths 10-12, Refiners & Marketers Bldg.

RODS—WELDING

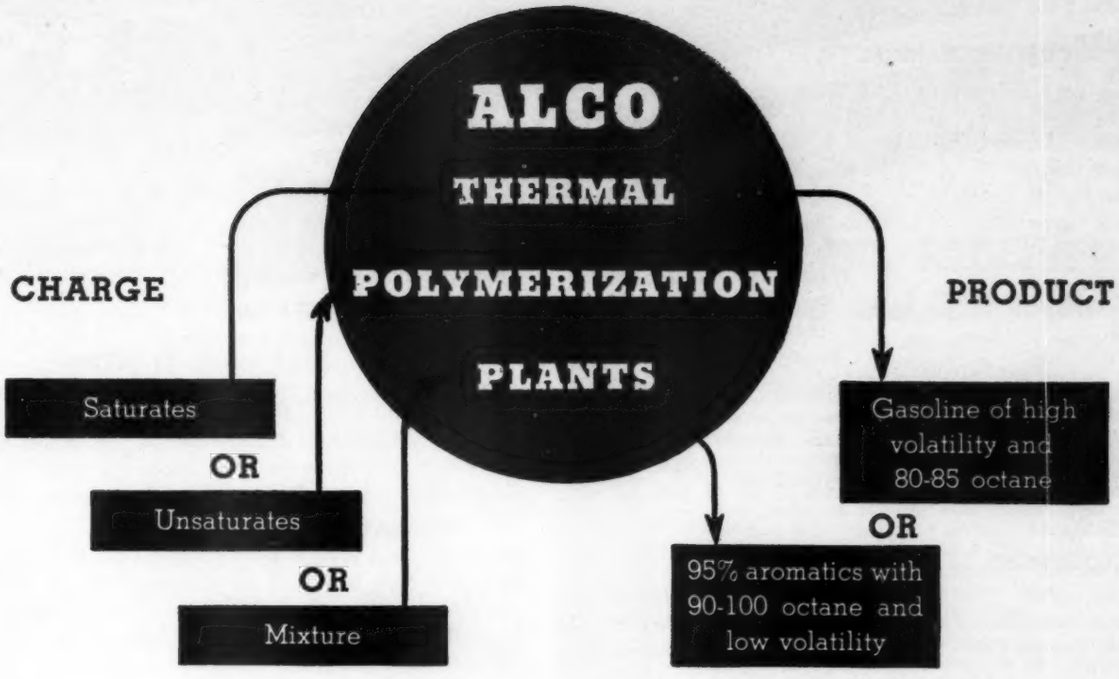
Air Reduction Sales Co. ..... Booths 31-33, Oklahoma Bldg.
American Steel & Wire Co. ... Booths 93 to 118 incl., Oklahoma Bldg.
General Electric Co. ..... 2 Drake Drive
Hart Welding Supply Co. ..... Booths 91-120, Oklahoma Bldg.
Haynes Stellite Co. ..... Booths 6-9, California Bldg.
Lincoln Electric Co. ..... Booths 67-69, Oklahoma Bldg.
Linde Air Products Co. ..... Booths 6-9, California Bldg.
Stoody Co. ..... Booths 31-33, Oklahoma Bldg.
Unaweld Mfg. Co. of Texas ..... Booth 22, California Bldg.
Union Carbide & Carbon Co. ..... Booths 6-9, California Bldg.
Welders Supply Co. ..... Booths 1-2, Texas Bldg.
Westinghouse Electric & Mfg. Co. .... Booths 91-120, Oklahoma Bldg.
Wilson Welder & Metals Co. ..... Booth 34, Oklahoma Bldg.

ROOFS—BREATHER

Chicago Bridge & Iron Works ..... Booths 86-125, Texas Bldg.

ROPE—WIRE

American Cable Co. ..... Booth 103, Oklahoma Bldg.
American Steel & Wire Co. .. Booths 93 to 118 incl., Oklahoma Bldg.
Broderick & Bascom Rope Co. .... Booth 5, Continental Supply Bldg.
Columbia Steel Co. ..... Booths 93 to 118 incl., Oklahoma Bldg.



DUAL FLEXIBILITY IN POLYMERIZATION

With separately controlled pyrolysis and reaction coils it is possible to regulate, to within narrow limits, the extent of the pyrolysis of the charged gas and to separately and accurately control the actual polymerization reaction.

Operated on the lower temperature range, Alco Thermal Polymerization Plants produce a liquid gasoline consisting of aromatics, napthenes, olefins, and some paraffins. Operated at a higher temperature level, a product can be obtained consisting of 95% aromatics and 5% of other cyclic compounds. These two products, both suitable as gasoline or gasoline blending materials, can be produced from the same charging stock.

Flexibility not only in choice of charging stock—saturates, unsaturates, or any mixture of the two—but also in choice of product . . . is Dual Flexibility.

LICENSING AGENTS, for Pure Oil Polymerization Process, Gyro Vapor Phase Cracking, and Gray Process Clay Treating.

NOTE CHANGE OF ADDRESS

DIVISION OF AMERICAN LOCOMOTIVE COMPANY

30 CHURCH STREET
CABLE ADDRESS:
"ALPRODUCTS"—NEW YORK
"ALPRODUCTS"—LONDON

ALCO PRODUCTS INC.

NEW YORK, N. Y.
LONDON OFFICE:
25 VICTORIA STREET
LONDON, S. W. I. ENGLAND

Hazard Wire Rope Co. ..... Booth 28, Texas Bldg.
Leschen, A., & Sons Rope Co. ..... Booth 118, Texas Bldg.
Macwhyte Co. ..... Booth 38, California Bldg.
Roebling's, John A., Sons Co. ..... 5 Drake Drive
Steel Sales Corp. ..... Booths 64-66, Texas Bldg.
Union Wire Rope Corp. Booths 80, 81, 82, 129, 130, 131, Texas Bldg.
Wickwire Spencer Steel Co. ..... Booths 109-110, Oklahoma Bldg.

RUBBER GOODS—MECHANICAL

Atlas Supply Co. ..... 7 Arcade Way
Boston Woven Hose & Rubber Co. ..... 7 Arcade Way
Bridgeport Machine Co. ..... 6 Drake Drive
Frick-Reid Supply Corp. ..... 1 Drake Drive
Goodrich Rubber Co., B. F. ..... Booth 43, Texas Bldg.
Goodyear Tire & Rubber Co. ..... Booths 52, 53, 54, Texas Bldg.
Gustin-Bacon Mfg. Co. ..... Booths 52, 53, 54, Texas Bldg.
Happy Belting Co. ..... Booths 1-2, Oklahoma Bldg.
Hewitt Rubber Corp. ..... Booths 79-132, Texas Bldg.
Iverson Tool Co. ..... Booth 49, California Bldg.
Jarecki Mfg. Co. ..... Booths 79-132, Texas Bldg.
Jenkins Bros. ..... Booths 54-55, Refiners & Marketers Bldg.
Manhattan Rubber Mfg. Div. ..... 5 Drake Drive
Mechanical Rubber Co. ..... Booth 11, Continental Supply Bldg.
Quaker City Rubber Co. ..... 12 Skelly Drive
Republic Rubber Co. ..... Booths 25, 26, 27, Texas Bldg.
Thermoid Rubber Co. ..... 3 Drake Drive

SAFETY EQUIPMENT

American Optical Co. ..... Booth 57, Scientific & Technical Bldg.
Mine Safety Appliances Co. ..... Booths 48-49, Oklahoma Bldg.
Safety Equipment Service Co. ..... Booth 74, Oklahoma Bldg.

SAND BLASTING EQUIPMENT

Leland Equipment Co. ..... 12 Skelly Drive
Ruemelin Mfg. Co. ..... 12 Skelly Drive

SAVERS—OIL

Guiberson Corp. ..... Booths 106-107, Texas Bldg.
Hercules Tool Co. ..... Booths 55-56, Texas Bldg.
Hughes Tool Co. ..... Booths 91-93, Texas Bldg.
Kerotest Mfg. Co. ..... Booths 89-122, Oklahoma Bldg.
Lucey Products Corp. ..... 8 Oil City Way
MacClatchie Mfg. Co. ..... 2 Drake Drive
Oil Well Improvements Co. ..... Booths 94, 95, 116, Texas Bldg.

SAWS

Armstrong-Blum Mfg. Co. ..... Booths 1, 2, 37, 38, Ref. & Mark. Bldg.
Barnes Co., Inc., W. O. ..... Booth 19, California Bldg.
Gates Hardware Co. ..... 13 Skelly Drive
Simonds Saw & Steel Co. ..... Booths 1-2, Arcade

SCHOOLS

Hemphill Diesel Schools ..... Booth 7, Scientific & Technical Bldg.
Spartan School of Aeronautics ..... Booths 46-59, Ref. & Mark. Bldg.

SCRAPERS—PIPE LINE

National Transit Pump & Machine Co. ..... 1 Drake Drive

SCREWS

Standard Pressed Steel Co. ..... Booth 7, Arcade

SEISMOGRAPH EQUIPMENT & INSTRUMENTS

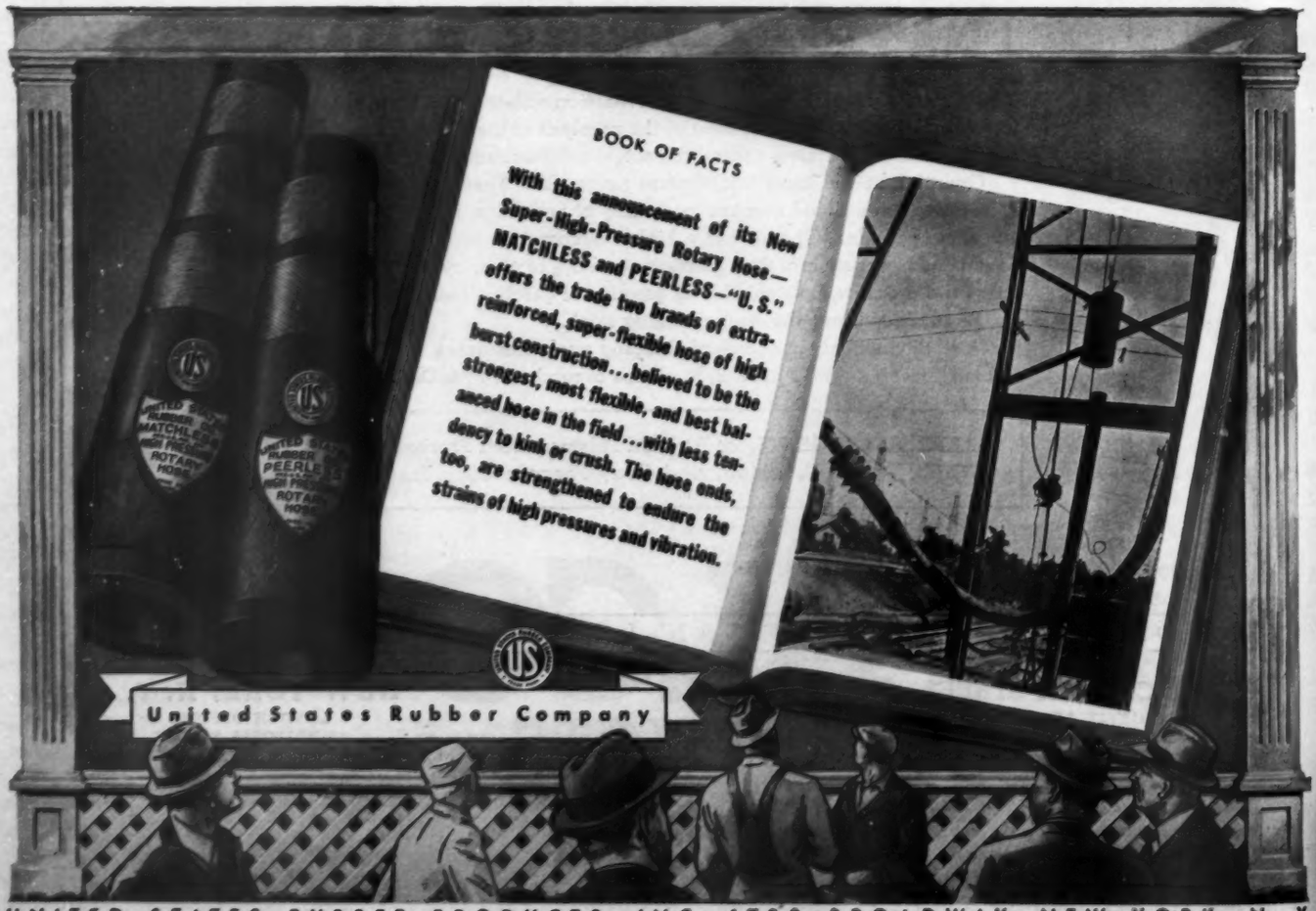
Engineering Laboratories ..... Booth 11, Scientific & Technical Bldg.
Seismograph Service Corp. ..... Booth 11, Scientific & Technical Bldg.

SEPARATORS—GAS & OIL

Black, Sivalls & Bryson, Inc. ..... Booths 39, 40, 65, 66, California Bldg.
Hanlon-Waters, Inc. ..... Booths 43, 83, 84, 127, 128, Texas Bldg.
National Tank Co. ..... Booths 96-115, Texas Bldg., 9 Oil City Way
Smith Separator Co. ..... Booths 90, 121, 122, Texas Bldg.
Tulsa Boiler & Machinery Co. ..... 3 California Ave.

SERVICE STATION EQUIPMENT

Hayes Equipment Mfg. Co. ..... Booth 3, Refiners & Marketers Bldg.
Romort Mfg. Co. ..... Booth 13, Arcade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With this announcement of its New Super-High-Pressure Rotary Hose—MATCHLESS and PEERLESS—"U. S." offers the trade two brands of extra-reinforced, super-flexible hose of high burst construction...believed to be the strongest, most flexible, and best balanced hose in the field...with less tendency to kink or crush. The hose ends, too, are strengthened to endure the strains of high pressures and vibration.
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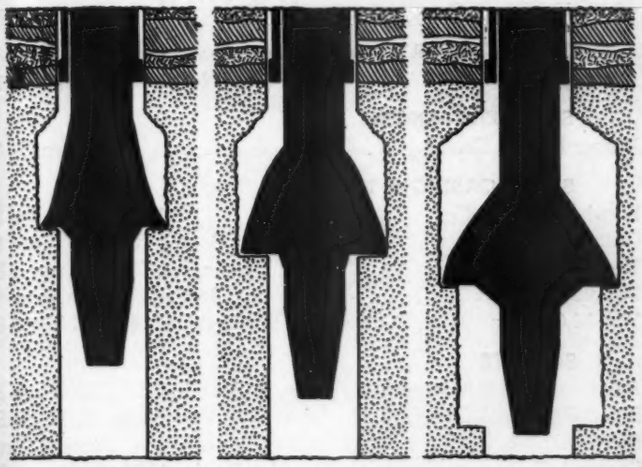
UNITED STATES RUBBER PRODUCTS, INC., 1790 BROADWAY, NEW YORK, N. Y.

"THE" ROE UNDERDIGGER

FOR

GREATER OIL RECOVERY from New and Old Wells

HOW IT OPERATES



1 2 3

1—A special set of "starting cutters" are used to open the hole below the casing. These cutters are designed to dig their way into the walls of the hole forming the shoulder on which the underdigging operation is started. *This shoulder may be made at any point desired below the casing.*

2—After the shoulder has been made, the "starting cutters" are replaced by a set of underdigging cutters, and the operation of increasing the diameter of the hole is then carried to the bottom, or to any point desired, of the hole.

3—Enlargement of the hole is governed by the size of the underdigging cutters used. In reconditioning old wells, the walls of the "pay" formation may be cleaned and the diameter of the hole increased at several succeeding operations as little as one inch at a time, or the maximum enlargement of more than double the drilled diameter of hole may be made by using only the No. 2 and No. 3 underdigging cutters.

Ordinarily only three sets of cutters (furnished with each sale or rental tool) are required: No. 1, "starting cutters"; No. 2 underdigging cutters enlarge the diameter of the hole approximately 50%; and No. 3 underdigging cutters increase the diameter of the hole approximately double its original size.

Initial production of both rotary and cable tool drilled wells may be increased through use of the Roe "Pay" Underdigger by removing mud, cement and other accumulations from the face of the "pay" to facilitate the free flow of oil into the hole.

Initial production in wells with "tight" formations that have been "shot" one or more times may be increased through use of the Roe "Pay" Underdigger by removing that part of the formation that has been glazed and closed by the heat of the "shot."

Initial production in "lime" wells may be increased through use of the Roe "Pay" Underdigger by enlarging the "pay" formation area to more than double its drilled size that the chemicals used in acidizing may contact a greater wall area.

Production in old "sand", "lime" or "shale" wells may be increased through the use of the Roe "Pay" Underdigger by removing paraffin, gypsum, salt, mud and other obstructions from the walls of the formation for the free flow of oil into the hole. If desired a reservoir more than double the drilled size of the hole may be formed at any point in the "pay" formation. *The Roe "Pay" Underdigger has increased production from 15% to over 200% on many wells during the past two years. Results have been outstanding on 95% of the wells on which it has been used.*

U. S. Patent No. 2012775

SEE THIS NEW TOOL

in the Bridgeport Building
at the oil show

Or write for Bulletin No. 36 which contains valuable information on underdigging—the new method of increasing oil and gas production.

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Specify MEDART for ALL OIL RIGS

In the oil fields—where equipment is subjected to especially rough use and abuse—Medart has a long and favorable record of designing and building equipment that really "stands up and takes it." For all oil rig requirements—new and replacement—specify Medart!

MEDART V-BELT DRIVE

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More effective transmission of power... Reduced belt expense ...The economy of short center drives... Longer life... Uniform drives and positive speeds resulting from uniform tension and extreme flexibility... No vibration... Cast iron sheaves furnished with any number of grooves —all pitch diameters... Also Medart V-Belts.

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(Self Aligning)

An efficient dust-sealed, anti-friction bearing made for all shaft sizes—self oiling, expansion or non-expansion types—straight or taper sleeve... Cut down friction and consequent losses—insure smoother operation, longer life and trouble-free service...Interchangeable with ring-oiling type shown below.

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Large pillow blocks —shaft sizes from 1 3/16 to 10 in.—with wedge-type adjusting base plates.

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Tokheim Co. ..... Booth 44, Refiners & Marketers Bldg.
Westinghouse Electric & Mfg. Co. .. Booths 91, 92, 119, 120, Okla. Bldg.

SHOES—CASING

Baash-Ross Tool Co. ..... Booth 69, Texas Bldg.
Baker Oil Tools, Inc. ..... Booths 99-112, Oklahoma Bldg.
Beaumont Iron Works Co. ..... 1 Drake Drive
Cameron Iron Works ..... 7 Pennsylvania Ave.
Hinderliter Tool Co. ..... Booths 22-24, Texas Bldg.
International Derrick & Equipment Co. ..... 10 Drake Drive
Larkin Packer Co. ..... Booths 80-81, Oklahoma Bldg.
Lucey Products Corp. ..... 8 Oil City Way
Robinson Packer Co. ..... Booth 5, Oklahoma Bldg.
Spang & Co. ..... Booths 47-58, California Bldg.
Titusville Iron Works Co. ..... 6 Beeville Lane

SHOOTING—WELL

Du Pont de Nemours & Co., E. I. ..... Booth 16, Arcade

SHOVELS

Ames Baldwin Wyoming Co. ..... Booth 3, California Bldg.
Gates Hardware Co. ..... 13 Skelly Drive

SIGNS—DISPLAY

American Can Co. ..... Booths 45-60, Refiners & Marketers Bldg.

SILENCERS—ENGINE

Weber Engine Co. ..... 7 Arcade Way

SLIPS—CASING & TUBING

Baash-Ross Tool Co. ..... Booth 69, Texas Bldg.
Guiberson Corp. ..... Booths 106-107, Texas Bldg.
Hydril Co. ..... Booths A-B, Outside Texas Bldg.
Mission Mfg. Co. ..... Booths 119-120, Texas Bldg.
W-K-M Co., Inc. ..... Booths 60, 61, 62, 43, 44, 45, California Bldg.

SOCKETS

American Iron & Machine Works Co. .. Booths 51-52, Oklahoma Bldg.
Baash-Ross Tool Co. ..... Booth 69, Texas Bldg.
Baird Mfg. Co. ..... Booth 9, Arcade
Spang & Co. ..... Booths 47-58, California Bldg.

SPEARS

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Brauer Machine & Supply Co. ..... Booth 16, California Bldg.
Bridgeport Machine Co. ..... 6 Drake Drive
Houston Engineers ..... Booths 60, 61, 62, 43, 44, 45, California Bldg.
International Derrick & Equipment Co. ..... 10 Drake Drive
Spang & Co. ..... Booths 47-58, California Bldg.

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Baker Oil Tools, Inc. ..... Booths 99-112, Oklahoma Bldg.
Bovaird Supply Co. ..... Booths 25-27, Texas Bldg.
Bridgeport Machine Co. ..... 6 Drake Drive
Cameron Iron Works ..... 7 Pennsylvania Ave.
Guiberson Corp. ..... Booths 106-107, Texas Bldg.
Hercules Tool Co. ..... Booths 55-56, Texas Bldg.
Hinderliter Tool Co. ..... Booths 22-24, Texas Bldg.
Larkin Packer Co. ..... Booths 80-81, Oklahoma Bldg.
Lucey Products Corp. ..... 8 Oil City Way
Oil Well Improvements Co. ..... Booths 94-116, Texas Bldg.
Spang & Co. ..... Booths 47-58, California Bldg.
W-K-M Co., Inc. ..... Booths 60, 61, 62, 43, 44, 45, California Bldg.

SPUDDERS

Allsteel Products Mfg. Co. ..... 9 Arcade Way
Bucyrus-Erie Co. ..... 2 Texas Drive
Cooper, Fred E. ..... 15 Arcade Way
Franks Mfg. Co. ..... 3 Arcade Way
Keystone Driller Co. ..... 11 Oil City Way
Moore & Co., Lee C. ..... Booths 65-66, Oklahoma Bldg.
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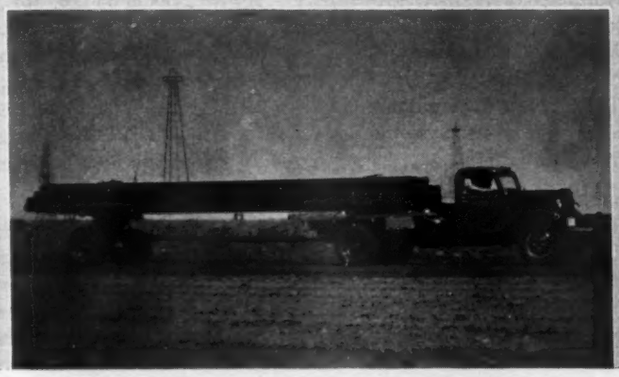
. . . WORLD'S FOREMOST ENGINEERS AND MANUFACTURERS OF

ALL-WHEEL-DRIVE MOTOR TRUCKS AND TRUCK-TRACTORS



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IF YOU are attending the big exposition in Tulsa and are interested in the most modern type of transportation, for every branch of the oil industry, visit the display of Marmon-Herrington all-wheel-drive trucks and truck-tractors in Space No. 7, Oil City, Kansas. There you will see two Marmon-Herrington all-wheel-drive Ford V-8 Models—a four-wheel-drive and a six-wheel-drive—and also one of the standard six-wheel-drive units in the regular Marmon-Herrington line. In addition, an all-wheel-drive Ford V-8 will be available for demonstration. It will pay you to inspect these trucks thoroughly for they will solve many an important transportation problem for you or your organization.

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COINCIDENT with the opening of the International Petroleum Exposition in Tulsa, the Marmon-Herrington Company, Inc., takes pleasure in announcing the appointment of a new distributor to serve and co-operate with the transportation division of the oil industry as well as all others who want more efficient transportation at less cost. The name of this new company is the Marmon-Herrington Sales, Inc. It is headed by Dan LeR. Dresser and has its headquarters at 220 Virginia Avenue, Ponca City, Okla. Mr. Dresser will maintain a complete sales and service organization and will attend the International Petroleum Exposition in Tulsa, with leading sales officials from Marmon-Herrington factory.

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Maloney Tank Mfg. Co. ..... Booth 14, Ref. & Mark. Bldg., 21 Okla. Drive
National Tank Co. ..... Booths 96-115, Texas Bldg., 9 Oil City Way
Parkersburg Rig & Reel Co. ..... Booths 74-75, Texas Bldg., 12 Drake Drive
Vinson Supply Co. ..... Booth 133, Texas Bldg.

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American Sheet & Tin Plate Co. ..... Booths 93 to 118, incl., Okla. Bldg.
Columbia Steel Co. ..... Booths 93 to 118, incl., Oklahoma Bldg.
Republic Steel Corp. ..... Booths 16-21, Texas Bldg.
Standard Pressed Steel Co. ..... Booth 7, Arcade
Tennessee Coal, Iron & Railroad Co. ..... Booths 93 to 118, incl, Okla.
Youngstown Sheet & Tube Co. ..... 2 Drake Drive

STRAIGHTENERS—KELLY

Baker Oil Tools, Inc. ..... Booths 99-112, Oklahoma Bldg.

STRAIGHTENERS—PIPE

American Iron & Machine Works Co. ..... Booths 51-52, Oklahoma Bldg.
Baash-Ross Tool Co. ..... Booth 69, Texas Bldg.
Black, Sivalls & Bryson, Inc. ..... Booths 39-66, California Bldg.
Crutcher-Rolfs-Cummings, Inc. ..... Booths 60, 61, 62, 43, 44, 45, Calif. Bldg.
Lucey Products Corp. ..... 8 Oil City Way
New Deal Specialty Co. ..... 11 Oklahoma Drive
W-K-M Co., Inc. ..... Booths 60, 61, 62, 43, 44, 45, California Bldg.

STRETCHERS—BELT

Ratigan, J. P. ..... 1 Drake Drive

SUBSTRUCTURES

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American Iron & Machine Works Co. ..... Booths 51-52, Okla. Bldg.
International Derrick & Equipment Co. ..... 10 Drake Drive
Moore & Co., Lee C. ..... Booths 65-66, Oklahoma Bldg.
Muskogee Iron Works, Inc. ..... 9 Skelly Drive
Parkersburg Rig & Reel Co. ..... Booths 74-75, Texas Bldg., 12 Drake Drive
Western Iron & Foundry Co. ..... Booth 17, California Bldg.

SUCKER ROD SHOCK ABSORBERS

Engineering Co., The ..... Booths 79-132, Texas Bldg.
Jarecki Mfg. Co. ..... Booths 79-132, Texas Bldg.
Ratigan, J. P. ..... 1 Drake Drive

SUPERHEATERS

Broderick Co. ..... 5 Drake Drive
Foster-Wheeler Corp. ..... 3 Drake Drive

SUPPLY COMPANIES

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Bovaird Supply Co. ..... Booths 25, 26, 27, Texas Bldg.
Bridgeport Machine Co. ..... 6 Drake Drive
Continental Supply Co. ..... 2 Drake Drive
Frick-Reid Supply Corp. ..... 1 Drake Drive
International Supply Co. ..... 6 Beeville Lane
Jarecki Mfg. Co. ..... Booths 79-132, Texas Bldg.
Lucey Products Corp. ..... 8 Oil City Way
Mid-Continent Supply Co. ..... Booths 43, 44, 45, 46, 47, Okla. Bldg.
Murray Tool & Supply Co. ..... Booth A-B, Outside Texas Bldg.
National Supply Co. ..... 5 Drake Drive
Norvell-Wilder Supply Co. ..... 3 Skelly Drive
Oil Well Supply Co. ..... 3 Drake Drive
Republic Supply Co. ..... Booths 16, 17, 18, 19, 20, 21, Texas Bldg.

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Driftmeter, Inc. ..... Booth 108, Oklahoma Bldg.
Eastman Oil Well Survey Co. ..... Booths 44-59, Scien. & Tech. Bldg.
Mathey Machine Works, C. A. ..... Booth 16, Arcade
Sperry-Sun Well Surveying Co. ..... Booths 61-62, Scien. & Tech. Bldg.

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Guiberson Corp. ..... Booths 106-107, Texas Bldg.
Hinderliter Tool Co. ..... Booths 22-24, Texas Bldg.
Kinley, M. M., Co. ..... 5 Fitts St.
Mission Mfg. Co. ..... Booths 119-120, Texas Bldg.
Shaffer Specialty Co. ..... 7 Oklahoma Drive
Spang & Co. ..... Booths 47-58, California Bldg.

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SWIVELS

Brauer Machine & Supply Co. ..... Booth 16, California Bldg.
Continental Supply Co. ..... 2 Drake Drive
Emsco Derrick & Equipment Co. ..... 2 Drake Drive
International Derrick & Equipment Co. ..... 10 Drake Drive
Kinley, M. M., Co. ..... 5 Fitts St.
Lucey Products Corp. ..... 8 Oil City Way
National Supply Co. ..... 5 Drake Drive
Norvell-Wilder Supply Co. ..... 3 Skelly Drive
Oil Well Supply Co. ..... 3 Drake Drive
Portable Rig Co. ..... 3 West Virginia Ave.
Spang & Co. ..... Booths 47-58, California Bldg.

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Hanlon-Waters, Inc. ..... Booths 83-128, Texas Bldg.
Johnston & Jennings Co. ..... Booths 82-129, Oklahoma Bldg.
Maloney Tank Mfg. Co. ..... Booth 14, Ref. & Mark. Bldg., 21 Okla. Drive
National Tank Co. ..... Booths 96-115, Texas Bldg., 9 Oil City Way
Tulsa Boiler & Machinery Co. ..... 3 California Ave.
Vapor Recovery Systems Co. ..... Booth 126, Oklahoma Bldg.
Wiggins, John H. ..... Booths 86-125, Texas Bldg.

TANKS—STEEL

Black, Sivalls & Bryson, Inc. ..... Booths 39-66, California Bldg.
Chicago Bridge & Iron Works ..... Booths 86-125, Texas Bldg.
Hanlon-Waters, Inc. ..... Booths 83-128, Texas Bldg.
International Derrick & Equipment Co. ..... 10 Drake Drive
Maloney Tank Mfg. Co. ..... Booth 14, Ref. & Mark. Bldg., 21 Okla. Drive
National Tank Co. ..... Booths 96-115, Texas Bldg., 9 Oil City Way
Parkersburg Rig & Reel Co. ..... Booths 74-75, Texas Bldg., 12 Drake Drive
Titusville Iron Works Co. ..... 6 Beeville Lane
Tulsa Boiler & Machine Co. ..... 3 California Ave.
Western Iron & Foundry Co. ..... Booth 17, California Bldg.

TANKS—WOOD

Black, Sivalls & Bryson, Inc. ..... Booths 39, 40, 65, 66, California Bldg.
National Tank Co. ..... Booths 96-115, Texas Bldg., 9 Oil City Way
Parkersburg Rig & Reel Co. ..... Booths 74-75, Texas Bldg., 12 Drake Drive

TAPS—TAPERED

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Baash-Ross Tool Co. ..... Booth 69, Texas Bldg.
Beaumont Iron Works Co. ..... 1 Drake Drive
Bridgeport Machine Co. ..... 6 Drake Drive
Crane Co. ..... Booths 50-55, Refiners & Marketers Bldg.
Hinderliter Tool Co. ..... Booths 22-24, Texas Bldg.
Hughes Tool Co. ..... Booths 91-93, Texas Bldg.
Reed Roller Bit Co. ..... Booths 12-14, Texas Bldg.
Walworth Co. ..... Booths 104-107, Oklahoma Bldg.

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Brown Instrument Co. ..... Booths 39-64, Scientific & Technical Bldg.
Consolidated Ashcroft Hancock Co. ..... Booths 8-9, Scien. & Tech. Bldg.

Foxboro Co. ..... Booths 4-6, Scientific & Technical Bldg.
Leeds & Northrup Co. ..... Booths 29-30, Scientific & Technical Bldg.
McGregor Engineering Co. ..... Booth 24, Oklahoma Bldg.
Minneapolis-Honeywell Reg. Co. ... Booths 39-64, Scien. & Tech. Bldg.
Moorlane Co. ..... Booth 83, Oklahoma Bldg.
Palmer Co., The ..... Booth 60, Scientific & Technical Bldg.
Tagliabue Mfg. Co., C. J. ... Booths 32-33, Scientific & Technical Bldg.
Taylor Instruments Cos. ... Booths 35-36, Scientific & Technical Bldg.
Westcott & Greis, Inc. ..... Booths 41-43, Scientific & Technical Bldg.

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Gaso Pump & Burner Mfg. Co. ..... Booths 57-58, Texas Bldg.
Johnston & Jennings Co. ..... Booths 82-129, Oklahoma Bldg.
Walker Co., W. L. ..... Booths 56-57, California Bldg.

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Dodge Mfg. Co. ..... Booths 4-5, California Bldg.
Gustin-Bacon Mfg. Co. ..... Booths 52, 53, 54, Texas Bldg.
Happy Belting Co. ..... Booths 1-2, Oklahoma Bldg.
Link-Belt Co. ..... Booths 61-63, Texas Bldg.
O. C. S. Mfg. Co. ..... Booths 10-11, Okla. Bldg., 1 Skelly Drive
Reid Gas Engine Co., Jos. ..... 1 Drake Drive

TIME BOMBS

Du Pont de Nemours & Co., E. I. ..... Booth 16, Arcade

TIRES—AUTO

Goodrich Rubber Co., B. F. ..... Booth 43, Texas Bldg.
Goodyear Tire & Rubber Co. ..... Booths 52, 53, 54, Texas Bldg.
Gustin-Bacon Mfg. Co. ..... Booths 52, 53, 54, Texas Bldg.
Hewitt Rubber Corp. ..... Booths 79-132, Texas Bldg.
Lee Tire & Rubber Co. ..... Booth 40, Scientific & Technical Bldg.
Republic Rubber Co. ..... Booths 25-27, Texas Bldg.

TONGS

Byron Jackson Co. ..... Booths 25-28, Oklahoma Bldg.
Gearench Mfg. Co. ..... Booths 36-37, Texas Bldg.
Guiberson Corp. ..... Booths 106-107, Texas Bldg.
Iverson Tool Co. ..... Booth 49, California Bldg.
O'Bannon, Walter, Co. ..... Booth 104, Texas Bldg.
Ratigan, J. P. ..... 1 Drake Drive
Williams & Co., J. H. ..... Booths 3-4, Arcade

TOOLS—AIR

Ingersoll-Rand Co. ..... 2 Tyler St.
Leland Equipment Co. ..... 12 Skelly Drive

"MANZEL"
Chemical Feeders

For Injecting Treating Compounds into Crude Oil Lines

The "Manzel" Series "60" Chemical Feeder feeds the chemical into the oil line in exact proportion to the amount of oil pumped.

Entire driving mechanism enclosed and operates in bath of oil at all times.

Pumping unit, only part that comes in contact with the chemical, arranged on outside of feeder where it is readily accessible.

PISTON VALVE ACTION—Fitted with Manzel patented piston valve, most satisfactory valve for handling treating chemical. Only one valve used for both suction and discharge. Valve may be taken out for cleaning without disconnecting feed line.

ACCURATE REGULATION—Feed may be adjusted from a fractional part of a drop per stroke up to any amount desired.

CHEMICAL RESERVOIR—Furnished with or without three-gallon chemical container. Container has large hinged cover for quick filling, stainless steel gauge (graduated in quarts) and an extra large strainer which does not interfere with filling.

SIGHT FEED—Any "Manzel" Feeder can be supplied with sight feed to show the exact amount of chemical being pumped.

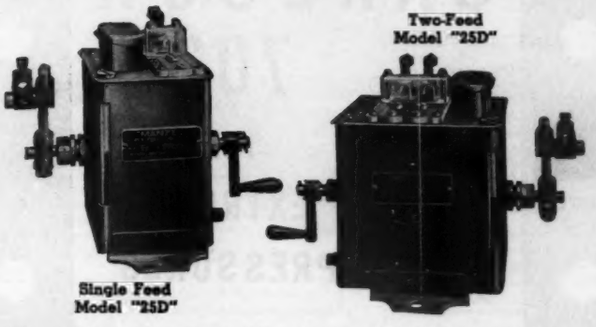
Made with ratchet, rotary, direct lever, or motor drive

Write for Bulletin 60-A

**Booth No. 50
Oklahoma Bldg.**

MANZEL BROTHERS COMPANY
336-338 Babcock Street **Buffalo, N. Y., U. S. A.**

"MANZEL"
Force Feed Lubricators



For Most Efficient and Economical Lubricating of Cylinders and Bearings

The "Manzel" Model "25" Lubricator will handle any grade of oil and will deliver it to the cylinder or bearing, regardless of pressure or temperature, in exact proportion to the speed of the engine, or other equipment, on which installed.

Will feed plenty of oil for the heaviest duty engine or pump, yet may be regulated to supply fractional parts of a drop when used on compressors requiring very little lubrication.

Built to withstand hard usage, and to pump against high pressure. Has a wide range of adjustment and extra large reservoir capacity.

PUMPING UNITS REMOVABLE WITHOUT STOPPING LUBRICATOR—All working parts completely enclosed in reservoir, yet any unit may be removed in two to three minutes time without stopping lubricator or interfering with other units.

FEED ALWAYS IN SIGHT—A large, clear-vision, heavy glass sight feed shows at all times exactly how much oil is being supplied. Not simply an indicator to show lubricator is working, but actually shows the number of drops being delivered to each point.

ACCURATE FEED REGULATION—Each feed independently adjustable and may be regulated to supply from a fractional part of a drop to a maximum of 13 drops with every plunger stroke.

Made with 1 to 30 feeds, rotary or ratchet drive

**Booth No. 50
Oklahoma Bldg.**

Write for Catalog 25-B

MANZEL BROTHERS COMPANY
336-338 Babcock Street **Buffalo, N. Y., U. S. A.**

TOOLS—CLEANING

"Berg" Cleaning Tool Div. ..... Booth 10, Arcade
Concrete Surfacing Machinery Co. ..... Booth 10, Arcade

TOOLS—FISHING

American Iron & Machine Co. ..... Booths 51-52, Oklahoma Bldg.
Baash-Ross Tool Co. ..... Booth 69, Texas Bldg.
Bridgeport Machine Co. ..... 6 Drake Drive
Hinderliter Tool Co. ..... Booths 22, 23, 24, Texas Bldg.
Keystone Driller Co. ..... 11 Oil City Way
Lane-Wells Co. ..... 7 Skelly Drive
Lucey Products Corp. ..... 8 Oil City Way
Spang & Co. ..... Booths 47-58, California Bldg.
Star Drilling Machine Co. ..... Booths 48-49, Ref. & Mark. Bldg.

TOOL HOUSES

American Iron & Machine Works Co. ..... Booths 51-52, Oklahoma Bldg.
Black, Sivalls & Bryson, Inc. ..... Booths 39-66, California Bldg.
Brauer Machine & Supply Co. ..... Booth 16, California Bldg.
International Derrick & Equipment Co. ..... 10 Drake Drive

TOOL JOINTS

Baash-Ross Tool Co. ..... Booth 69, Texas Bldg.
Beaumont Iron Works Co. ..... 1 Drake Drive
Bridgeport Machine Co. ..... 6 Drake Drive
Byron Jackson Co. ..... Booths 25-28, Oklahoma Bldg.
Continental Supply Co. ..... 2 Drake Drive
Emsco Derrick & Equipment Co. ..... 2 Drake Drive
Frick-Reid Supply Corp. ..... 1 Drake Drive
Hinderliter Tool Co. ..... Booths 22, 23, 24, Texas Bldg.
Hughes Tool Co. ..... Booths 91-93, Texas Bldg.
Hydril Co. ..... Booths A-B, Outside Texas Bldg.
International Derrick & Equipment Co. ..... 10 Drake Drive
International Supply Co. ..... 6 Beeville Lane
Lucey Products Corp. ..... 8 Oil City Way
Murray Tool & Supply Co. ..... Booths A-B, Outside Texas Bldg.
National Supply Co. ..... 5 Drake Drive
National Tube Co. ..... Booths 93 to 118, incl., Oklahoma Bldg.
Norvell-Wilder Supply Co. ..... 3 Skelly Drive
Oil Well Supply Co. ..... 3 Drake Drive
Reed Roller Bit Co. ..... Booths 12-14, Texas Bldg.
Republic Supply Co. ..... Booths 16-21, Texas Bldg.
Spang & Co. ..... Booths 47-58, California Bldg.

TOOLS—MACHINE SHOP

Arrow Tools, Inc. ..... 12 Skelly Drive
Davis Boring Tool Co. ..... Booths 80-81, Oklahoma Bldg.

GARLOCK 7021

for EXTREME PRESSURES

GASKETS cut from GARLOCK 7021 Compressed Asbestos Sheet give exceptional service on pipe lines and other equipment handling gasoline, oil, gas or steam at high temperatures and extreme pressures. Tough, yet resilient—GARLOCK 7021 is particularly economical and efficient for severe conditions.

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Palmyra, New York
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Houston, Texas
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See us at the Tulsa Show
Booths 59 and 60, Texas Bldg.

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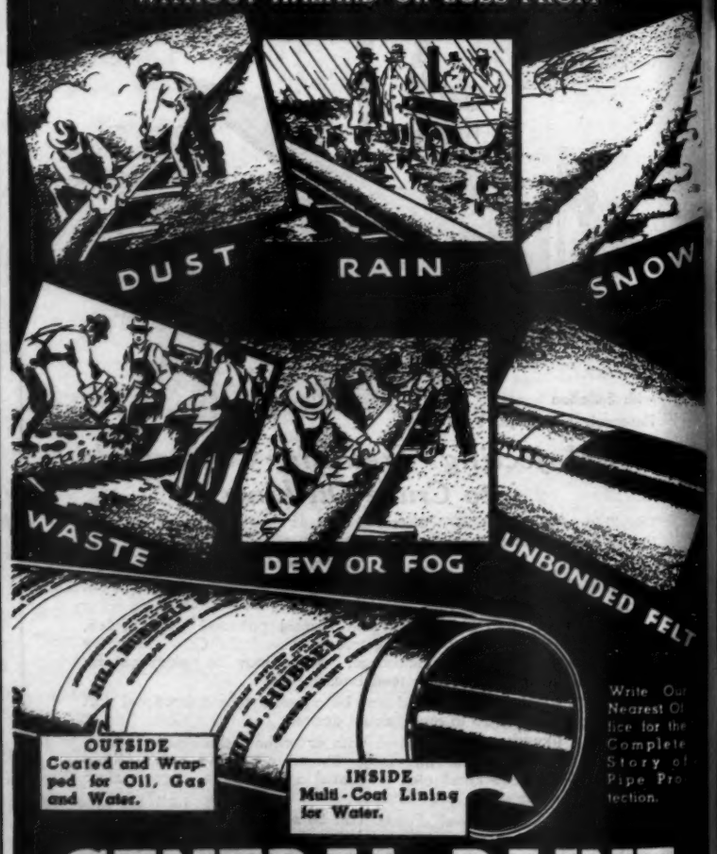
(Mill Applied)
THE SCIENTIFIC AND ECONOMICAL WAY
WITHOUT HAZARD OR LOSS FROM



GENERAL PAINT CORPORATION
Hill Hubbell & Co., Division
San Francisco, Los Angeles, Oakland, Portland, Seattle, Spokane, Tulsa
In Illinois: Hill Hubbell & Co., Chicago, Ill.

Delta Mfg. Co.	Booths 1-2, Arcade
Goddard & Goddard, Inc.	Booth 2, Arcade
Machine Tool & Supply Co.	Booths 1-7, Arcade
Standard Tool Co.	Booths 1-2, Arcade
Starrett Co., L. S.	Booths 1-2, Arcade
Simonds Saw & Steel Co.	Booths 1-2, Arcade
United States Electrical Tool Co.	Booth 6, Arcade
Williams & Co., J. H.	Booths 3-4, Arcade

TRACTORS & TRACTOR EQUIPMENT

Allis-Chalmers Mfg. Co.	15 Arcade Way
Allsteel Products Mfg. Co.	9 Arcade Way
Caterpillar Tractor Co.	10 Skelly Drive
Cooper, Fred E.	15 Arcade Way
International Harvester Co.	3 Arcade Way
John Deere Tractor Co.	10 Skelly Drive
Trackson Co.	8 Tyler St.

TRAILERS

Athey Truss Wheel Co.	10 Skelly Drive
Cleveland Trencher Co.	1 Oil City Way
Covered Wagon	1 Drumright Ave.
International Harvester Co.	3 Arcade Way
Leland Equipment Co.	12 Skelly Drive
Spencer Trailer Co.	12 Skelly Drive
Soldner of Salina	15 Oklahoma Drive
Trackson Co.	8 Tyler St.

TRANSFORMERS

Allis-Chalmers Mfg. Co.	2 Oil City Way
General Electric Co.	2 Drake Drive
Kuhlman Electric Co.	Booth 64, California Bldg.
Pennsylvania Transformer Co.	Booth 53, California Bldg.
Wagner Electric Co.	Booth 55, Oklahoma Bldg.
Westinghouse Electric & Mfg. Co.	Booths 91-120, Oklahoma Bldg.

TRAPS—STEAM

Armstrong Machine Works	Booth 78, Texas Bldg.
Consolidated Ashcroft Hancock Co.	Booths 8-9, Scien. & Tech. Bldg.
Davis Regulator Co.	Booths 41-43, Scientific & Technical Bldg.
Fisher Governor Co.	Booth 89, Texas Bldg.
Hanlon-Waters, Inc.	Booths 83-128, Texas Bldg.

TREADS—STAIR

Arrowhead Iron Works, Inc.	Booth 133, Texas Bldg.
Blaw-Knox Co.	1 Drake Drive
Parkersburg Rig & Reel Co.	Booths 74-75, Texas Bldg., 12 Drake Drive

Monsanto

FOR THE OIL INDUSTRY

SELECTIVE SOLVENTS AND OTHER CHEMICALS

You will find that Monsanto products meet your most exacting requirements. Their quality, uniformity and increasingly wide application in refining makes them worthy of your attention. We shall be glad to discuss your present or potential requirements of chemicals.

Phenol
Cresylic Acid and Cresols
Muriatic Acid
Sulfuric Acid
Caustic Soda
Chlorine
Chlorinated Solvents

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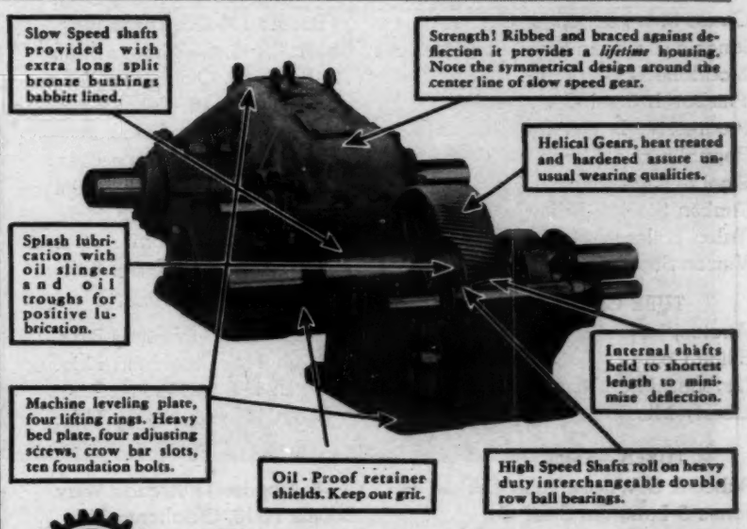
Tribune Tower, CHICAGO
372 Brannan St., SAN FRANCISCO
614 Midland Bldg., CLEVELAND
Brown Marx Bldg., BIRMINGHAM

Chemicals


Slow Speed shafts provided with extra long split bronze bushings babbitt lined.
Strength! Ribbed and braced against deflection it provides a lifetime housing. Note the symmetrical design around the center line of slow speed gear.
Helical Gears, heat treated and hardened assure unusual wearing qualities.
Splash lubrication with oil slinger and oil troughs for positive lubrication.
Internal shafts held to shortest length to minimize deflection.
Machine leveling plate, four lifting rings. Heavy bed plate, four adjusting screws, crow bar slots, ten foundation bolts.
Oil-Proof retainer shields. Keep out grit.
High Speed Shafts roll on heavy duty interchangeable double row ball bearings.

IXL
The Mark of Quality

Be sure to see IXL Pump Drives in Operation at the—

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Jarecki Manufacturing Co. Exhibit
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Foote Bros. Booth No. 55, California Bldg.

Look at them! Check each point! There is no other pump drive with all these advantages!

The design is the result of the composite ideas of the best brains of many leading oil producers, checked by Foote Bros. Engineers and built into a line of sturdy units to meet rigid IXL requirements.

Here is a distinct advance in oil well unit design—*an oil well pump drive* beyond comparison with modified speed reducers of the ordinary type—an oil well pump drive designed *in the oil fields* and backed by over 75 years of experience in manufacturing this class of equipment.

Certainly a hard combination to beat!

Before specifying your next pump drive let us give you more details.

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533 Mayo Bldg., Tulsa, Okla.

TRUCKS—MOTOR

Chevrolet Motor Co. ..... 5 Oklahoma Drive
Four Wheel Drive Auto Co. ..... 5 Arcade Way
Halliburton Oil Well Cementing Co. ..... 5 Arcade Way
International Harvester Co. ..... 3 Arcade Way
Marmon-Herrington Co. ..... 7 Oil City Way
White Motor Co. ..... 6 Oklahoma City Ave.

TUBES—BOILER

Babcock & Wilcox Tube Co. ..... Booth 8, Arcade; 11 Arcade Way
Jones & Laughlin Steel Corp. ..... Booths 12, 13, 14, 15, 16, Okla. Bldg.
Moorlane Co. ..... Booth 83, Oklahoma Bldg.
Steel & Tubes, Inc. ..... Booths 16-21, Texas Bldg.
Tulsa Boiler & Machinery Co. ..... 3 California Ave.

TUBES—BRASS

American Brass Co. ..... Booth 11, Texas Bldg.
Bridgeport Brass Co. ..... Booth 8, Arcade; 8 Arcade Way
Chase Brass & Copper Co. ..... Booths 134-135, Texas Bldg.
Progressive Brass Mfg. Co. ..... Booth 11, Texas Bldg.
Steel & Tubes, Inc. ..... Booth 16-21, Texas Bldg.
Vinson Supply Co. ..... Booth 133, Texas Bldg.

TUBES—CONDENSER

American Brass Co. ..... Booth 11, Texas Bldg.
Chase Brass & Copper Co. ..... Booths 134-135, Texas Bldg.
Jones & Laughlin Steel Corp. ..... Booths 12-16, Oklahoma Bldg.
Moorlane Co. ..... Booth 83, Oklahoma Bldg.
Pittsburgh Steel Co. ..... Booths 4-6, Texas Bldg.
Progressive Brass Mfg. Co. ..... Booth 11, Texas Bldg.
Republic Steel Corp. ..... Booths 16-21, Texas Bldg.
Steel & Tubes, Inc. ..... Booths 16-21, Texas Bldg.
Timken Steel & Tube Co. ..... Booths 10-12, Ref. & Mark. Bldg.
Tulsa Boiler & Machinery Co. ..... 3 California Ave.
Vinson Supply Co. ..... Booth 133, Texas Bldg.

TUBE CLEANERS

Airetool Mfg. Co., The ..... Booth 43, Refiners & Marketers Bldg.
Elliott Co. ..... Booth 111, Oklahoma Bldg.
Lagonda Mfg. Co. ..... Booth 111, Oklahoma Bldg.
Liberty Mfg. Co. ..... Booth 111, Oklahoma Bldg.

TUBES—STILL

Babcock & Wilcox Tube Co. ..... 8 Arcade, 11 Arcade Way
Jones & Laughlin Steel Co. ..... Booths 12-16, Oklahoma Bldg.
Moorlane Co. ..... Booth 83, Oklahoma Bldg.
National Tube Co. ..... Booths 93 to 118, incl., Oklahoma Bldg.
Pittsburgh Steel Co. ..... Booths 4, 5, 6, Texas Bldg.
Republic Steel Corp. ..... Booths 16-21, Texas Bldg.
Timken Steel & Tube Co. ..... Booths 10-12, Ref. & Mark. Bldg.

TUBE SUPPORTS

Midwest Piping & Supply Co. ..... 1 Drake Drive
Ohio Steel Foundry Co. ..... Booths 76-77, Texas Bldg.
Sivyer Steel Casting Co. ..... Booths 70-71, Texas Bldg.

TURBINES

Allis-Chalmers Mfg. Co. ..... 2 Oil City Way, 15 Arcade Way
General Electric Co. ..... 2 Drake Drive
Terry Steam Turbine Co. ..... 4 Skelly Drive
Westinghouse Electric & Mfg. Co. ..... Booths 91-120, Oklahoma Bldg.
W-K-M Co., Inc. ..... Booths 60, 61, 62, 43, 44, 45, California Bldg.
Worthington Pump & Machinery Corp. ..... 4 Skelly Drive

UNDERREAMERS

Baash-Ross Tool Co. ..... Booth 69, Texas Bldg.
Baker Oil Tools, Inc. ..... Booths 99-112, Oklahoma Bldg.
Bridgeport Machine Co. ..... 6 Drake Drive
Gulberson Corp. ..... Booths 106-107, Texas Bldg.
MacClatchie Mfg. Co. ..... 2 Drake Drive
Reed Roller Bit Co. ..... Booths 12-14, Texas Bldg.

UNIFORMS—SERVICE STATION

Waco Garment Mfg. Co. ..... Booth 15, Refiners & Marketers Bldg.

UNIONS

Central Forging Co. ..... Booth 29, Oklahoma Bldg.
Crane Co. ..... Booths 50-55, Refiners & Marketers Bldg.
Darling Valve & Mfg. Co. ..... Booths 101-102, Oklahoma Bldg.
Flagg & Co., Stanley G. ..... Booth 10, Scientific & Technical Bldg.
Gaso Pump & Burner Mfg. Co. ..... Booths 57-58, Texas Bldg.
Hughes Tool Co. ..... Booths 91-93, Texas Bldg.
Kerotest Mfg. Co. ..... Booths 89-122, Oklahoma Bldg.
Lunkenheimer Co. ..... Booths 130-131, Oklahoma Bldg.
Youngstown Steel Products Co. ..... Booth 4, Continental Supply Bldg.

UNITS—ELECTRIC GENERATING

Allis-Chalmers Mfg. Co. ..... 2 Oil City Way, 15 Arcade Way
Buffalo Gasolene Motor Co. ..... Booths 51-55, California Bldg.
Climax Engineering Co. ..... 2 Drake Drive
Fairbanks-Morse & Co. ..... 2 Drake Drive
General Electric Co. ..... 2 Drake Drive
Lucey Products Corp. ..... 8 Oil City Way
Portable Rig Co. ..... 3 West Virginia Ave.
Shaffer Specialty Co. ..... 7 Oklahoma Drive
Waukesha Motor Co. ..... 6 Skelly Drive
Weber Engine Co. ..... 7 Arcade Way
Westinghouse Electric & Mfg. Co. ..... Booths 91-120, Oklahoma Bldg.
Worthington Pump & Machinery Corp. ..... 4 Skelly Drive
Young Engine Corp. ..... 5 Texas Drive

UNITS—GEAR REDUCTION

Allis-Chalmers Mfg. Co. ..... 2 Oil City Way, 15 Arcade Way
American Steel Derrick Co. ..... 8 Drake Drive
Atlas Supply Co. ..... 7 Arcade Way
Climax Engineering Co. ..... Booth 6, Continental Supply Bldg.
Continental Supply Co. ..... 2 Drake Drive
Falk Corp. ..... 2 Drake Drive
Foote Bros. Gear & Machine Co. ..... Booth 55, California Bldg.
Frick-Reid Supply Corp. ..... 1 Drake Drive
General Electric Co. ..... 2 Drake Drive
International Derrick & Equipment Co. ..... 10 Drake Drive
Landry, Max. E. ..... Booths 51-55, California Bldg.
Link-Belt Co. ..... Booths 61-63, Texas Bldg.
Lufkin Foundry & Machine Co. ..... 15 Skelly Drive
Mid-Continent Supply Co. ..... Booths 43-47, Oklahoma Bldg.
National Supply Co. ..... 5 Drake Drive
Oil Well Supply Co. ..... 3 Drake Drive
Parkersburg Rig & Reel Co. ..... Booths 74-75, Texas Bldg., 12 Drake Drive
Portable Rig Co. ..... 3 West Virginia Ave.
Westinghouse Electric & Mfg. Co. ..... Booths 91-120, Oklahoma Bldg.

UNITS—OIL WELL SERVICING

Allis-Chalmers Mfg. Co. ..... 15 Arcade Way
Allsteel Products Mfg. Co. ..... 9 Arcade Way
Cooper, Fred E. ..... 15 Arcade Way
Franks Mfg. Co. ..... 3 Arcade Way
Muskogee Iron Works ..... 9 Skelly Drive
Wilson Mfg. Co. ..... 8 Oklahoma City Ave.

UNITS—PUMPING

American Steel Derrick Co. ..... 8 Drake Drive
Bovaird Supply Co. ..... Booths 25, 26, 27, Texas Bldg.
Bridgeport Machine Co. ..... 6 Drake Drive
Continental Supply Co. ..... 2 Drake Drive
Emsco Derrick & Equipment Co. ..... 2 Drake Drive
Frick-Reid Supply Corp. ..... 1 Drake Drive
International Derrick & Equipment Co. ..... 10 Drake Drive
International Supply Co. ..... 6 Beeville Lane
Jarecki Mfg. Co. ..... Booths 79-132, Texas Bldg.
Jensen Bros. Mfg. Co. ..... 5 Pennsylvania Ave.
Lacy Oil Tool Co. ..... 3 Skelly Drive
Link-Belt Co. ..... Booths 61-63, Texas Bldg.
Lufkin Foundry & Machine Co. ..... 15 Skelly Drive
Mid-Continent Pump & Supply Co. ..... Booths 25, 26, 27, Texas Bldg.

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Beauty--Combined with effficiency

Attractive leases were little thought of until recent years. Now an attractive lease is considered as important as an attractive retail outlet. Oil men have been quick to appreciate the advantages of both.

Lufkin's efficient, trouble-proof equipment lends itself readily to attractive and well kept leases such as the one reproduced above.

Catalogue No. 36 contains completely illustrated layouts with blue print setting plans and engineering data and will be gladly mailed to oil men anywhere upon request.

INTERNATIONAL PETROLEUM EXPOSITION 1936

Lufkin

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Mid-Continent Supply Co. ..... Booths 43, 44, 45, 46, 47, Okla. Bldg.
National Supply Co. ..... 5 Drake Drive
Norvell-Wilder Supply Co. ..... 3 Skelly Drive
Oil Country Specialties Mfg. Co. . Booths 10-11, Okla., 1 Skelly Drive
Oil Well Supply Co. ..... 3 Drake Drive
Pacific Pump Works ..... Booths 25, 26, 27, Texas Bldg.
Parkersburg Rig & Reel Co. . Booths 74-75, Texas Bldg., 12 Drake Drive
Republic Supply Co. ..... Booths 16-21, Texas Bldg.
Western Iron & Foundry Co. ..... Booth 17, California Bldg.

UNITS—ROTARY DRILLING

Allis-Chalmers Mfg. Co. ..... 2 Oil City Way, 15 Arcade Way
Allsteel Products Mfg. Co. ..... 9 Arcade Way
Bridgeport Machine Co. ..... 6 Drake Drive
Continental Supply Co. ..... 2 Drake Drive
Cooper-Bessemer Corp. ..... 8 Skelly Drive
Emsco Derrick & Equipment Co. ..... 2 Drake Drive
Franks Mfg. Co. ..... 3 Arcade Way
Hydril Co. ..... Booths A-B, Outside Texas Bldg.
International Derrick & Equipment Co. ..... 10 Drake Drive
Keystone Driller Co. ..... 11 Oil City Way
Lucey Products Corp. ..... 8 Oil City Way
Mid-Continent Supply Co. ..... Booths 43-47, Oklahoma Bldg.
Murray Tool & Supply Co. ..... Booths A-B, Outside Texas Bldg.
National Supply Co. ..... 5 Drake Drive
Norvell-Wilder Supply Co. ..... 3 Skelly Drive
Oil Well Supply Co. ..... 3 Drake Drive
Portable Rig Co. ..... 3 West Virginia Ave.
Republic Supply Co. ..... Booths 16-21, Texas Bldg.
Shaffer Specialty Co. ..... 7 Oklahoma Drive
Sheldon Machinery Corp. ..... Continental Supply Exhibits
Titusville Iron Works Co. ..... 6 Beeville Lane
Waukesha Motor Co. ..... 6 Skelly Drive
Well Machinery & Supply Co. ..... 5 California Ave.
Wheland Co. ..... 8 Oil City Way
Wilson Mfg. Co. ..... 8 Oklahoma City Ave.

VALVES

Allen, Sproull & Allen ..... Booth 10, Scientific & Technical Bldg.
American Iron & Machine Works Co. . Booths 51-52, Oklahoma Bldg.
Atlas Supply Co. ..... 7 Arcade Way
Baker Oil Tools, Inc. ..... Booths 99-112, Oklahoma Bldg.
Bastian Blessing Co. ..... Booths 36-37, Oklahoma Bldg.
Black, Sivalls & Bryson, Inc. .... Booths 39, 40, 65, 66, California Bldg.
Bovaird Supply Co. ..... Booths 25-27, Texas Bldg.
Bridgeport Machine Co. ..... 6 Drake Drive
Burke-Greis Oil Co. ..... 12 Oil City Way
Cameron Iron Works, Inc. ..... 7 Pennsylvania Ave.
Carson Machine & Supply Co. ..... Booth 46, California Bldg.
Central Forging Co. ..... Booth 29, Oklahoma Bldg.
Chaplin-Fulton Mfg. Co. ..... Booth 40, Scientific & Technical Bldg.
Continental Supply Co. ..... 2 Drake Drive
Crane Co. ..... Booths 50-55, Refiners & Marketers Bldg.
Crosby Steam Gage & Valve Co. . Booths 41-43, Scien. & Tech. Bldg.
Darling Valve & Mfg. Co. ..... Booths 101-102, Oklahoma Bldg.
Everlasting Valve Co. ..... Booths 42-63, California Bldg.
Fairbanks Co. ..... Booths 25-27, Texas Bldg.
Frick-Reid Supply Corp. ..... 1 Drake Drive
Gas Power, Inc. ..... Booth 27, California Bldg.
Gasa Pump & Burner Mfg. Co. ..... Booths 57-58, Texas Bldg.
Gray Tool Co. ..... Booths 89, 90, 121, 122, Oklahoma Bldg.
Hanlon-Waters, Inc. ..... Booths 83-128, Texas Bldg.
Hercules Tool Co. ..... Booths 55-56, Texas Bldg.
Hills-McCanna Co. ..... Booth 1, California Bldg.
Homestead Valve Mfg. Co. ..... Booths 90-122, Texas Bldg.
Hughes Tool Co. ..... Booths 91-93, Texas Bldg.
Jarecki Mfg. Co. ..... Booths 79-132, Texas Bldg.
Jenkins Bros. ..... Booths 54-55, Refiners & Marketers Bldg.
Johnston & Jennings Co. ..... Booths 82-129, Oklahoma Bldg.
Kerotest Mfg. Co. ..... Booths 89, 90, 121, 122, Oklahoma Bldg.
Kunkle Valve Co. ..... Booth 10, Scientific & Technical Bldg.
Lucey Products Corp. ..... 8 Oil City Way
Lunkenheimer Co. ..... Booths 130-131, Oklahoma Bldg.
MacClatchie Mfg. Co. ..... 2 Drake Drive
Mason-Neilan Regulator Co. ..... Booths 14-15, Arcade
M. & H. Valve & Fittings Co. ... Booth 10, Scientific & Technical Bldg.
Merco-Nordstrom Valve Co. ..... Booths 37-38, Scien. & Tech. Bldg.
Mid-Continent Supply Co. ..... Booths 43-47, Oklahoma Bldg.
Midwest Equitable Meter Co. ..... Booths 37-38, Scien. & Tech. Bldg.
Mission Mfg. Co. ..... Booths 119-120, Texas Bldg.
Moorlane Co. ..... Booth 83, Oklahoma Bldg.
Morrison Bros. ..... Booth 5, Refiners & Marketers Bldg.
Murray Tool & Supply Co. ..... Booths A-B, Outside Texas Bldg.
National Supply Co. ..... 5 Drake Drive
Norvell-Wilder Supply Co. ..... 3 Skelly Drive
Oil Conservation Engineering Co. .... Booths 82-129, Oklahoma Bldg.
Oil Well Improvements Co. ..... Booths 94, 95, 116, Texas Bldg.
Oil Well Supply Co. ..... 3 Drake Drive
Otis Pressure Control Co. ..... Booth 35, Oklahoma Bldg.
Pittsburgh Equitable Meter Co. ..... 6 Arcade Way
Pittsburgh Valve & Fittings Corp. ..... 7 Arcade Way
Powell, Wm., Co. ..... Booths 45-58, Scientific & Technical Bldg.
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Republic Supply Co. ..... Booths 16-21, Texas Bldg.
Smith Separator Co. ..... Booths 90, 121, 122, Texas Bldg.
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Williams Valve Co., D. T. ..... Booth 10, Scientific & Technical Bldg.
W-K-M Co., Inc. ..... Booths 60, 61, 62, 43, 44, 45, California Bldg.

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Brown Instrument Co. ..... Booths 39-64, Scientific & Technical Bldg.

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American Iron & Machine Works Co. . Booths 51-52, Oklahoma Bldg.
Black, Sivalls & Bryson, Inc. ..... Booths 39-66, California Bldg.
Davis Regulator Co. ..... Booths 41-43, Scientific & Technical Bldg.
Fisher Governor Co. ..... Booth 89, Texas Bldg.
National Supply Co. ..... 5 Drake Drive
Tulsa Boiler & Machinery Co. ..... 3 California Ave.
Vapor Recovery Systems Co. ..... Booth 126, Oklahoma Bldg.

VESSELS—PRESSURE

Babcock & Wilcox Tube Co. ..... 8 Arcade, 11 Arcade Way
Black, Sivalls & Bryson, Inc. .... Booths 39, 40, 65, 66, California Bldg.
Blaw-Knox Co. ..... 1 Drake Drive
Smith Corp., A. O. ..... Booths 87-88, Oklahoma Bldg.
Tulsa Boiler & Machinery Co. ..... 3 California Ave.

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Columbian Vise & Mfg. Co. ..... Booths 1-2, Arcade
Ridge Tool Co. ..... Booths 29-30, Texas Bldg.
Toledo Pipe Threading Machine Co. . Booths 30-31, California Bldg.
Trimont Mfg. Co. ..... Booth 100, Oklahoma Bldg.
Walworth Co. ..... Booths 104-107, Oklahoma Bldg.
Williams & Co., J. H. ..... Booths 3-4, Arcade

WAGONS

Athey Truss Wheel Co. ..... 10 Skelly Drive

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WELDING EQUIPMENT

Adams, J. D., Co. ..... Booths 32-33, California Bldg.
Air Reduction Sales Co. ..... Booths 31-33, Oklahoma Bldg.
Bastian Blessing Co. ..... Booths 36-37, Oklahoma Bldg.
Big Three Welding Equipment Co. .... Booths 67-69, Oklahoma Bldg.
Burdett Oxygen Co. ..... Booths 1-2, Texas Bldg.
Compressed Industrial Gasses, Inc. ..... Booths 1-2, Texas Bldg.
General Electric Co. ..... 2 Drake Drive
Harnischfeger Sales Corp. ..... 8 Seminole St.
Hart Welding Supply Co. ..... Booths 91-120, Oklahoma Bldg.
Lincoln Electric Co. ..... Booths 67-69, Oklahoma Bldg.
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Union Carbide & Carbon Co. ..... Booths 6-9, California Bldg.
Waukesha Motor Co. ..... 6 Skelly Drive
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Westinghouse Electric & Mfg. Co. .... Booths 91-120, Oklahoma Bldg.
Wilson Welder & Metals Co. ..... Booth 34, Oklahoma Bldg.

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Allsteel Products Mfg. Co. ..... 9 Arcade Way
Caterpillar Tractor Co. ..... 10 Skelly Drive
Cooper, Fred E. ..... 15 Arcade Way
Franks Mfg. Co. ..... 3 Arcade Way
Muskogee Iron Works ..... 9 Skelly Drive
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Williamette-Hyster Co. ..... 10 Skelly Drive
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W-K-M Co., Inc. ..... Booths 60, 61, 62, 43, 44, 45, California Bldg.
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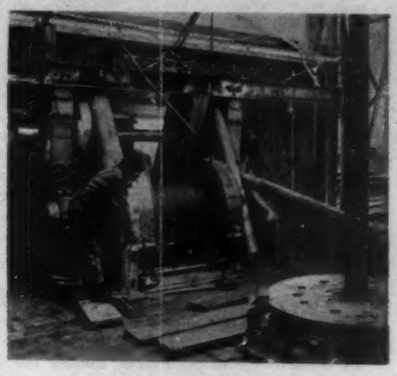

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Parallel Scale Slide Rule Developed to Calculate Vapor Pressure Data

By F. J. SMITH and H. B. SHARP

Standard Oil Co. (Indiana)

A new form of representation of vapor pressure data has recently been conceived by the writers. While this method is solely a new form of presentation and as such does not add to the present knowledge of fundamental vapor pressure data, it is felt, nevertheless, to be destined to find a wider practical acceptance than any previous such representation.

A review of the literature indicates that vapor pressure versus temperature correlations have been presented on the basis of theoretical as well as empirical considerations. Among the former is the simplified Clausius-Clapyron equation and the more exact development from the same equation as given by Nernst.[7] Also in the theoretical class will be found the combination of the principle of equal vapor concentration of Hildebrand with the Clausius-Clapyron equation. A presentation of data based on these principles has been made, among others, by the International Critical Tables and Wilson and Bahlke.[9]

Requirements

In the class of empirical presentations can be cited the modifications by Leslie and Carr[4] of the Ramsey and Young relation, the Duhring, the Cox,[3] and the Ashworth[1] relations. In addition, there can be cited the empirical chart as presented by Coates and Brown.[2] While no attempt is to be made to compare the accuracy of these methods, it can be stated that each of them has been presented in a final form which does not easily lend itself to one of the main purposes at hand, i.e., the rapid determination of the vapor pressures of various compounds at any desired temperature. It cannot be said, however, that a second primary purpose of such presentations, namely, the comparison and leveling of data and the estimation of an answer from a meager set of data, has not been admirably met by such forms.

To fulfill adequately the requirements of the former use, the presentation should be possessed of the following:

1. Maximum accuracy consistent with simplicity of design and operation.
2. Relatively constant accuracy throughout the entire range.
3. Minimum fatigue in using, to reduce errors.
4. Rapidity.
5. Compactness, relative nondestructibility and portability.

These purposes are felt to be fulfilled satisfactorily by the form of charts herein presented. As a basis for these plots, a Cox chart was prepared in the usual fashion, with an ordinate of log vapor pressure and an abscissa of $\frac{1}{T + 382}$, where vapor pressure is in pounds per square inch absolute and T is in °F. The Cox chart was chosen from a consideration of the above mentioned methods because of its proven simplicity and wide degree of adaptability. The data on compounds from methane to normal heptane, inclusive, as given in the International Critical Tables and the refrigerating Engineers,[6] were then plotted on this chart and leveled by constructing the best straight lines through the given data. The leveled values were then arranged in the form of a parallel scale chart by constructing another temperature scale identical to the first and laying off on parallel lines above it the data for the respective hydrocarbons as determined from the Cox chart. Obviously the vapor pressure values will plot as a repeating logarithmic scale because of the original construction of the Cox chart.

A. C. S.—A single setting of the slide mounted on a special rule will permit reading directly the vapor pressure of hydrocarbons up to normal heptane. The construction of the rule and its use were covered by the authors in a paper presented before the Petroleum Division of the A.C.S. at the Kansas City meeting.

Such a parallel scale chart thus adapts itself readily to makeup in the form of a familiar calculating slide rule, since all that is required to determine the vapor pressure of a compound is to project a straight line at right angles to the temperature scale at the desired location. Such a disposition of the charts herein presented was made. For this purpose they were cemented, one to each side, on a specially-prepared glued stick, the dimensions of a 20-inch log-log duplex slide rule. The rule was fitted with the usual indicator glass, thus completing the assembly.

Obviously such an arrangement of the data fulfills the above requirements completely in that:

1. The original combination of relative simplicity and accuracy of the Cox chart has been preserved.

2. A readability of the same percentage accuracy at all points of a vapor pressure scale has been preserved because of the repeating logarithmic scale.

3. A minimum of fatigue in using is gained by the fact that interpolation between graduated values is instinctive, much as in the case of the ordinary slide rule. In addition, interpolation is in one direction only, as compared to the more confusing two-direction interpolation of the usual coordinate plot.

4. An unmatched rapidity is gained by the fact that values for all compounds can be read from a single setting of the indicator glass. Such a point is readily apparent in calculations involving trial and error procedures, such as the estimation of dew points of mixtures of known composition, wherein the vapor pressure of each component must be determined at several different temperatures.

5. Such an arrangement offers the utmost in compactness, portability, etc., as compared with the usual coordinate representation. An idea of the accuracy and compactness of the arrangement can be gained from the fact that the 20-inch rule is equivalent to the usual coordinate Cox chart which has a temperature axis 20 inches long and a vapor pressure axis approximately 23 inches long if based on the heptane scale, increasing with each lighter component to a maximum of about 90 inches if based on the methane scale.

Conclusion

In conclusion, it is believed that the data upon which these charts have been constructed are considered of as high a degree of accuracy as present knowledge affords and will be found entirely suited for the purposes for which the charts are intended.

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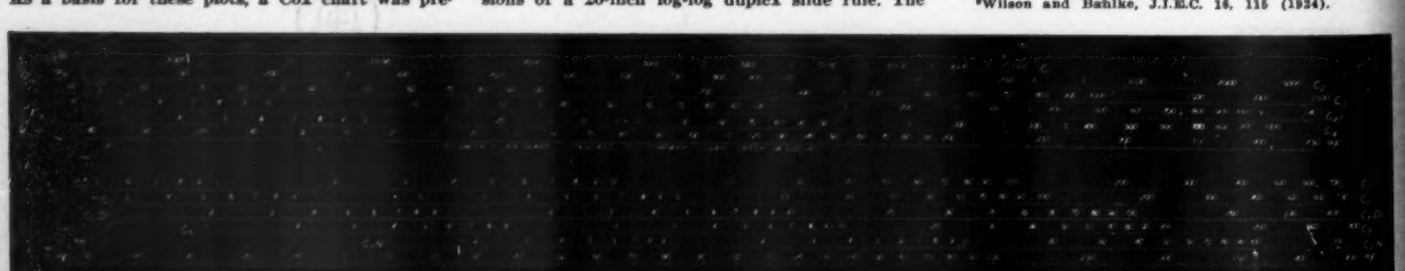
[1]Ashworth, J. Inst. Pet. Tech. 10, 787 (1924).
[2]Coates and Brown, Univ. Mich. Circular Series No. 1, Dec. 1928.
[3]Cox, J.I.E.C. 15, 592 (1923).
[4]Leslie and Carr, J.I.E.C. 17, 811 (1925).
[5]Ramsey and Young, Phil. Mag. 22, 37 (1886).
[6]Refrigerating Engineer 12, 287 (1926).
[7]Taylor, Treatise on Physical Chemistry, p. 1,387. D. Van Nostrand & Co., N. Y., 1931.
[8]Wilson and Bahlke, J.I.E.C. 16, 115 (1924).



From this chart may be derived the vapor pressure of hydrocarbons to and including heptane over a temperature range from minus 50° F. to 450° F. The simplicity and relatively constant accuracy afforded by the use of the two scales permits their ready use for design work. In the paper the authors suggest the two scales be glued to opposite sides of a rule and by mounting slide glasses on the rule, each glass being etched with a vertical hair line, one setting of the slide will permit the direct reading of the vapor pressure for any temperature. The authors identified the markings on the chart as follows: C_1—methane; C_2—ethane; C_3—propane; C_4'—isobutane; C_4—normal butane; C_5'—iso-pentane; C_5—normal pentane; C_6''—di-iso propyl; C_6—normal hexane and C_7—normal heptane

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Power Requirements for Central Well Pumping Units

By
HARRY M. RYDER
Ryder Scott Co.*

There have been times, and it is true at some places today, when generous and low cost fuel supplies, and widely spaced and few wells per lease relegated the matter of efficiency of fuel consumption to the category of those things in which the producer had small reason to indulge. The gradual diminution and, in some cases, disappearance of cheap fuel supplies, together with the increased fuel requirements in some districts, due to water and gas flooding have placed this problem very much on the "must" list, wherever profit, and therefore efficiency is of importance. Operators are all well aware that low crude prices and increasing taxes, labor and other costs add greatly to the need for efficient operation.

Where engines are used as motive power, studies of power consumption become very difficult. Here the power requirements of individual wells may be computed from data obtained with the aid of a dynamometer placed in the rod line, and a form of indicator card can be plotted to show the varying power demand throughout the cycle. This work is of special value in rod line design and layout work. To use a dynamometer to determine the instantaneous or average engine power requirements throughout the pumping cycle is cumbersome and difficult and requires much computation and approximation. Again, the use of fuel consumption as a measure of mechanical power delivered involves much assumption and approximation, and is valuable at best in determining average conditions. The condition that causes a breakdown is not the average, but peak load.

We have, therefore conducted this analysis on electrically driven central power equipment where conditions permitted accurate and repeatable measurements with accurate instruments, and have resulted in an accumulation of data which we believe to be of real value in the design and installation and operation of pumping equipment.

For the purpose of this analysis three central powers were selected, located adjacent to each other, and except for the differences in the powers themselves were operating under very similar conditions.

Practically all wells are approximately 1,900 feet deep, equipped with 2-inch 4-pound tubing, five-eighths inch rods, plunger type working barrels, and the all steel "Oklahoma" type jacks in common use in the Bradford field. The surface lines vary in length from very short to about 1,000 feet, all supported by long pendulums. Most of the wells pump some water, and for this reason so far as possible measurements were made while pumping oil in and out of the tubing.

*Presented at the Oil and Gas Conference, Pennsylvania State College, April 25, 1936.

In order to determine the variation in pumping rate of different wells, groups from all three powers were selected, the actual rate for each was determined, and from this and the speed and length of stroke of the polish rod, a measure of pumping "efficiency" was computed, this being the rate of production per unit length of travel per unit time. To determine the plunger travel, 5½ inches was deducted from the polish rod travel, this figure being indicated by Axelson's data on the stretch of tubing and rods under the conditions here encountered. The table in Figure 2 gives this information.

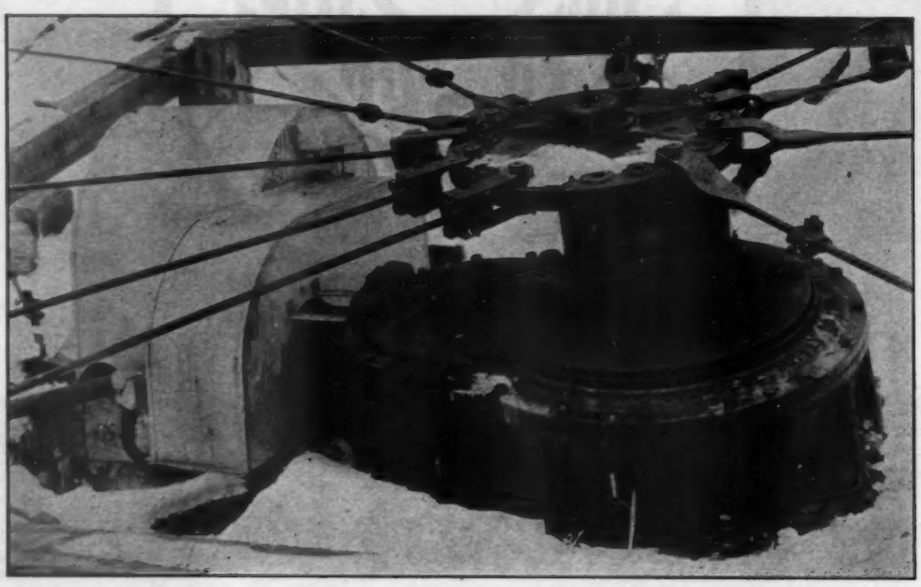

Fig. 1—Photograph of Power "A" on which the measurements were made. This power is driven by 30-horsepower, 1,200 r.p.m. induction motor through a V-belt without a shaft

In an effort to tie in the working age of the barrels with the efficiency, the chart, Figure 3 was prepared. As variations in the hours and barrels pumped per day, in the amount of floating sand, and in the amount of water are considerable, it would be too much to expect these points to fall on a straight line, and they don't. There is, however, a definite trend, the writer's idea being indicated by the curve shown. If this curve is an average, the efficiency of the average pump will be reduced to one-half its initial value in about four years. This data does suggest a definite and practical means of determining, according to any standards an operator may care to set, when a working barrel has been worn to such an extent that it should be repaired or replaced.

As a matter of interest, two special pumps were included in this chart. The one, a plunger pump reconditioned by the supplier (not factory) is shown with an exceedingly low efficiency. A barrel in which a liner barrel had been inserted is shown with an unexpectedly high value.

It will be seen from Figure 2 that the actual fluid delivered per hour varies considerably from well to well, the maximum on the list shown being approximately two and one-half times the minimum. The effect of this on power requirements, or rather the great lack of such effect, will be noticed later.

As many measurements as possible were made on Power "A." See photograph Figure 1. This is the latest type with all hardened steel cut gears and all roller bearings, with one crank, all roller bearing equipped, and with alemite lubricated clevis pins. All gears run in an oil bath. The power is driven by a 30-horsepower, 1,200 r.p.m. induction motor through a multiple V belt without intermediate shaft. This would seem to be the last word in machine efficiency.

As all wells to be operated from this power were staked before its installation, the power builder was able to predetermine its theoretically proper location. How well this worked out will be indicated later.

The power itself was capable of operating at 8⅛ and 16⅜ strokes a minute, with either an 18-inch or 24-inch stroke. In practice the slow speed is used principally when making repairs or adjustments to jacks or wells. The 24-inch stroke was used at first, but when so operated, the large number of wells required more than the full load rating. The stroke was, therefore, reduced to the shorter adjustment.

Powers "B" and "C" were used to determine the difference in efficiencies of such machines. Power "B" is an old style, almost new, single eccentric geared power, with cast gears, babbit bearings, and belt driven from a 15-horsepower motor through a jack shaft with roller bearings, and all flat belts. This power operated 15 strokes

FIGURE 2—OPERATING DATA ON THREE POWERS

Power "A"—16 2/3 Strokes per Minute

Well No.	Stroke (in.)	Barrels per hour	Age of barrels (months)	Efficiency*
A	17	2.00	6	10.45
B	20	2.99	5	12.38
C	18½	3.13	3	14.81
D	16⅝	2.20	6	11.81
E	16¾	2.25	13	12.61
F	16⅛	1.96	3	10.72
		2.41		

Power "B"—15 Strokes per Minute

G	20	.76	†5	3.49
H	17⅝	1.34	19	7.30
I	16	1.41	26	8.96
J	16⅝	1.77	23	10.46
K	16⅝	1.45	21	8.56
L	16	1.11	19	7.06
		1.29		

Power "C"—13 Strokes per Minute

M	24⅝	2.02	35	8.06
N	32⅛	2.17	12	9.79
O	24	2.02	29	8.41
P	24⅛	2.47	22	10.14
Q	21⅛	3.23	12	15.5
R	24⅛	3.23	25	13.2
S	24	1.53	15	6.34
		2.52		

*Rate per unit length of stroke per unit time. Corrected for stretch of rods and tubing. †Recon.

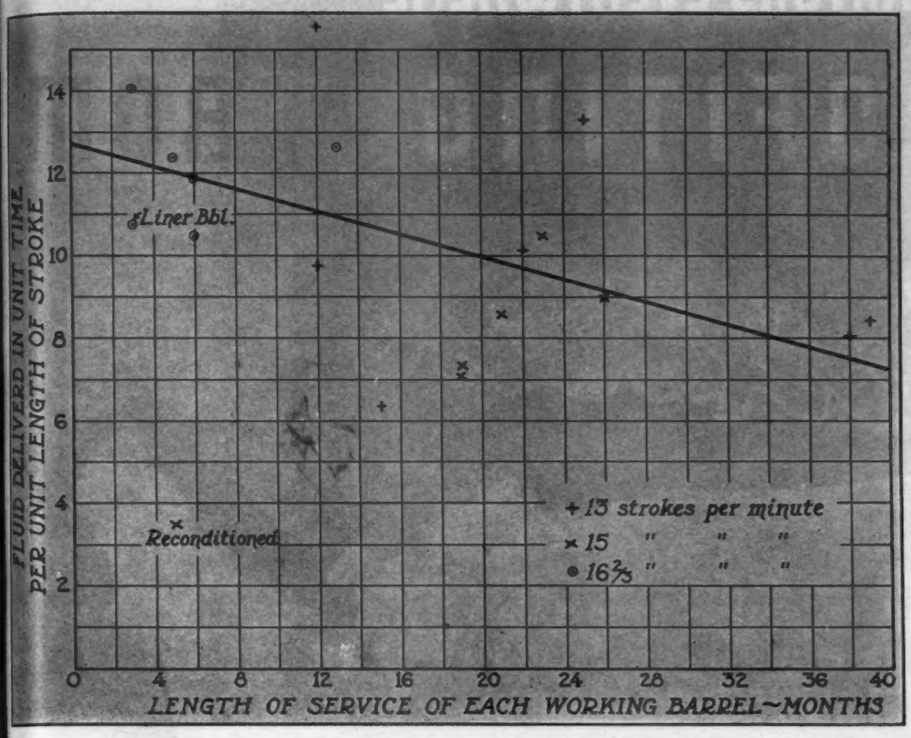
FLUID DELIVERED IN UNIT TIME PER UNIT LENGTH OF STROKE
8 Liner Bbl.
Reconditioned
+ 13 strokes per minute
× 15 " " "
• 16⅔ " " "
LENGTH OF SERVICE OF EACH WORKING BARREL—MONTHS

Fig. 3—Chart comparing the age of the working barrel with the efficiency of the pump

a minute on a 16-inch stroke. Power "C" is a standard make 20-foot, double eccentric, band wheel power, driven by a 35-horsepower motor through a jack shaft with roller bearings and with flat belts. This power operated 13 strokes a minute with a 24-inch stroke.

The distribution of wells on Power "A" is shown in Figure 4. The power operates without shelter except for a small hood on the motor and belts, and a small control shed to one side. The blind spot is very small and was so selected as not to interfere with any rod line.

For the measurement of power consumption, two meters were used, one an ordinary watt hour meter, which by counting the revolutions per minute of the disc furnished a record of the integrated average consumption and demand, and the other an Esterline graphic meter, with a high speed chart furnishing not only instantaneous maximum and minimum demand figures, but giving excellent plots of power demand variations throughout the pumping cycle.

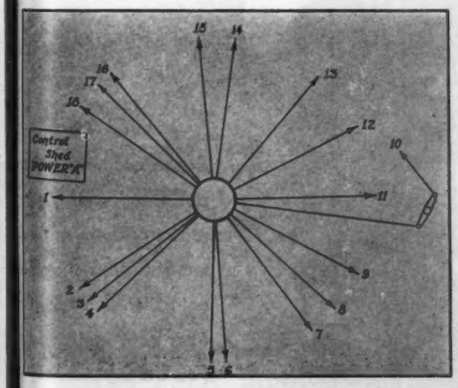

Fig. 4—Distribution of rod lines around Power "A." Note how well No. 10 was brought in to balance the power system

Test Procedure

The actual procedure for the tests was as follows: The power was first operated with no wells hooked on. In the case of Power "A," the crank pin friction was so slight that there was no tendency to wrap the live rods around the power. After reading meters under this condition, one well was hooked on and readings again taken, and a chart made. Additional wells were hooked on one at a time until all wells were operating. As a check, the procedure was then reversed and readings taken until the wells were again unhooked. In the selection of wells to hook on, at first wells were selected whose rods were located as close together as possible, to determine the number which could be pumped on one side without causing the instantaneous power demand to exceed the power rating. After this an effort was made to balance the power as well as possible in order to determine the effect of power balancing on power consumption. Various degrees of unbalancing were then tried out to study the effects of such conditions.

FIGURE 5—ELECTRIC POWER REQUIREMENTS

No. wells hooked on	Average kilowatts demand	Maximum instantaneous demand, kw.	Minimum instantaneous demand, kw.	Total swing in kilowatts
0	3.3	2.9	2.1	.8
1	3.98	5	—2	3
2	5.12	17	—4	21
3	6.35	20.8	—5	25.8
4	6.75	24.2	—7	31.2
5	7.96	26.8	—4	30.8
6	9.95	30	—4	..
7	9.55	17.3	1.9	15.4
8	10.32	13.1	3.8	9.3
9	11.12	15.3	6	9.3
10	12.3	16.4	6.9	9.5
11	13.1	19.3	3.3	16
12	14.3	16.9	8.1	8.8
13	15.1	15.6	12.2	3.4
14	16.3	23.4	9.7	13.7
15	17.5	25	8.8	16.2
16	18.2	26.3	8.2	18.1
17	19.45	27.9	7.3	20.6
18	21.2	25	14	11

Figure 5 constitutes a tabulation of the data derived from a set of such readings for Power "A" with an 18-inch stroke. In Figure 6 will be found plotted the results of the tests made on Power "A," with both short and long strokes. With no wells hooked on the power consumption is approximately 3 kilowatts, about 4 horsepower. This is the sum of the power lost in the windings of the motor and of all mechanical losses, and would indicate an overall full load efficiency of between 75 and 80 per cent for the whole mechanism, including the motor and belts, a remarkably high figure.

The two straight lines indicate the power requirements with various wells hooked on. Several important conclusions are here indicated. First

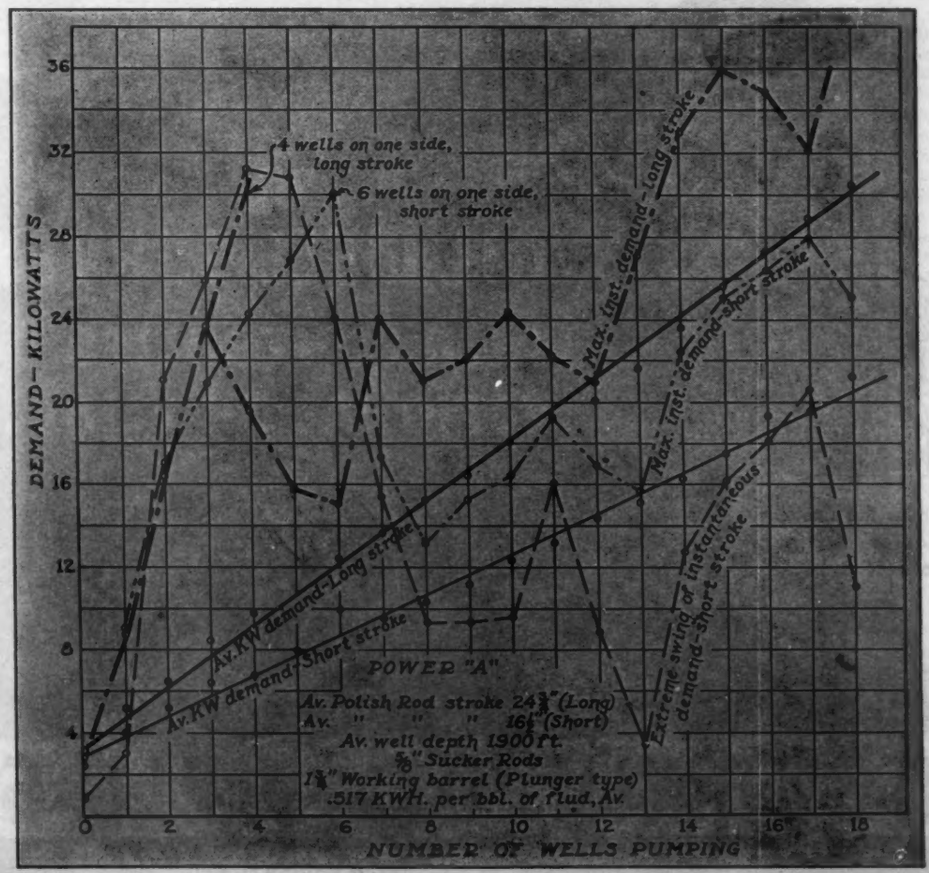
4 wells on one side, long stroke
6 wells on one side, short stroke
Max. inst. demand-Long stroke
Max. inst. demand-Short stroke
Av. KW demand-Long stroke
Av. KW demand-Short stroke
Extreme swing of instantaneous demand-Short stroke
POWER "A"
Av. Polish Rod stroke 24¾" (Long)
Av. " " " 16½" (Short)
Av. well depth 1900 ft.
⅝" Sucker Rods
1¾" Working barrel (Plunger type)
.517 KWH. per bbl. of fluid, Av.
DEMAND—KILOWATTS
NUMBER OF WELLS PUMPING

Fig. 6—Plotted results of tests made on Power "A" with both long and short strokes. Also included is a curve showing the maximum swing of the instantaneous power demand

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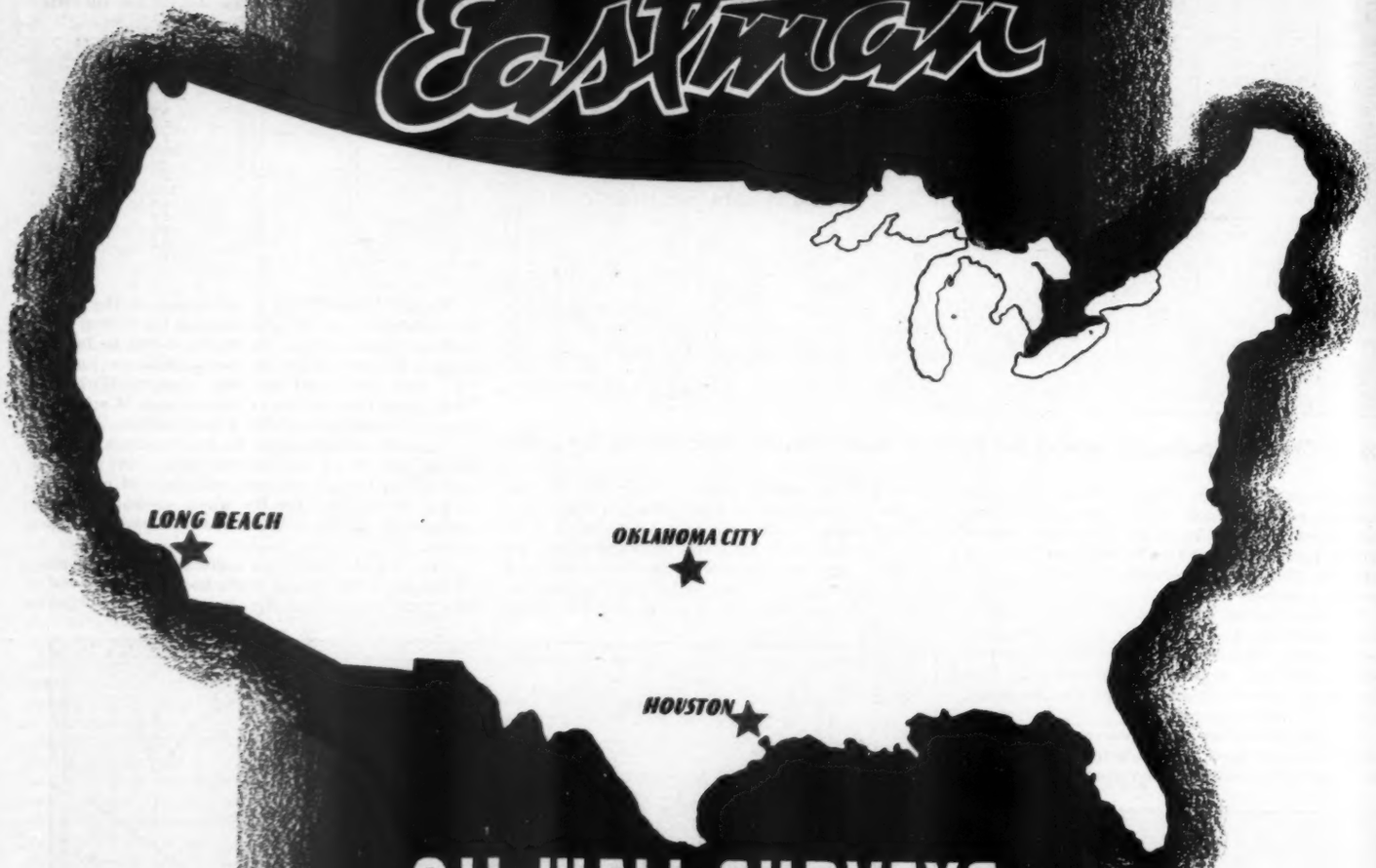

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and most important, the power required is directly proportional to the number of wells pumped, irrespective of the degree of balancing of the power, and irrespective of the working barrel efficiency. If six wells are all hooked on one side, with the power severely out of balance, the actual power required is the same as though the six wells were evenly distributed around the power.

The dot-and-dash curves indicate the maximum instantaneous power requirements for each combination used. The degree of unbalancing here is very clearly shown. Where these curves are high, the unbalancing is great, where these curves are low the power is more nearly in balance. In the case of the short stroke data, the power was way out of balance when six wells were hooked on, and almost perfectly in balance when 13 wells were hooked on, and yet the power requirements for pumping the wells, to all practical purposes, were directly proportional to the number of wells pumped. Balancing a power does not save energy, but it must be easier on the power to be in balance, and of course more wells can be safely carried on balanced power.

Stroke of Pump

It will be noted too that the power required to pump any given number of wells is almost proportional to the length of stroke. Note that the power required at full load on the long stroke is 1.26 kilowatts per inch of stroke, and on the short stroke is 1.15 kilowatts per inch of stroke.

Although there can be, and in this case there is, a large variation in length of polish rod strokes for the one power stroke, when the power stroke is changed, all polish rod strokes will change nearly proportionately, and, although the point was not proved in the field, the writer is satisfied that the power requirements are proportional to the length of polish rod strokes, no matter how the variations in length of polish rod strokes may be obtained. That is, the doubling of the length of the stroke of a particular polish rod will be accompanied by an exact doubling of the power required to pump that well per hour, irrespective of how that doubling was accomplished, whether by changing the power stroke, by adjusting the jack, or by the introduction of a stroke post or tie over or other means, excepting only that the actual frictional losses of additional bearing surfaces must be added to the total. If, then, a jack operates with less power when the beam moves below the horizontal than when it moves above it, it is because in the first case the stroke is less.

From a practical standpoint, then, it would seem that the shortest polish rod stroke which will enable the well to be pumped off in the desired time at the speed selected or available will be easiest on the machinery, rods and well equipment, and therefore best. Just what is the desired time will vary in each case, but the ability of the pumper to be in each of his numerous points of activity when he should be there will be an important factor in such determination.

FIGURE 7—FOUR-DAY TEST ON POWER "A"

Well No.	4 days' prod. (bbls.) Oil	Water	Ave. prod. (bbls.) Oil	Water
9	35.91	0	8.98	0
5	37.05	0	9.26	0
15	15.01	2.42	3.75	.85
11	18.62	5.70	4.66	1.42
1	15.39	14.63	3.85	3.66
4	9.31	16.53	2.33	4.13
2	6.08	11.59	1.52	2.90
7	16.72	11.97	4.18	2.99
17	6.84	17.48	1.71	4.37
18	10.26	10.82	2.56	2.71
16	11.21	8.93	2.80	2.23
10	16.72	7.41	4.18	1.85
13	6.46	7.22	1.62	1.81
12	19.76	1.71	4.94	.43
Total	225.34	117.42	4.03	2.10
Total fluid	342.76		6.13	

Total kilowatt hours consumed: 177.
Kilowatt hours per bbl. oil: .786.
Kilowatt hours per bbl. fluid: .517.
Cost per bbl. oil (based on 2-cent power): 1.57 cents.
Cost per bbl. fluid (based on 2-cent power): 1.13 cents.

In the case of operators purchasing electric power through a demand meter, the importance of keeping the demand cost down may have considerable economic bearing on the best length of stroke.

In Figure 6 is also included a curve showing the maximum swing of the instantaneous power demand for each of the various loads. Obviously when the swing is great the power is far out of balance. When the swing is small the balance is good. Also when the swing is greater than the maximum instantaneous power demand (see, for instance, 2, 3, 4, 5 and 6 wells hooked on, short stroke) during a portion of the pumping cycle power is actually being returned to the line. That is, the wells are pulling the motor, which is acting as a generator and feeding back energy to the system. If a watt hour meter is in the circuit, this actually backs up, unless it is equipped with a ratchet. Some power companies do install meters equipped with ratchets. In such cases, this power is actually donated to the power company, and is sold by them elsewhere in their system. In the case of an engine driven power, this feed back is used to speed up the engine.

A test was run on Power "A" to determine the actual power consumption per barrel of oil raised. In this case 14 wells were pumped as much as necessary for four days, and accurate records kept of all necessary items. The pumper did not know that a power check was being made, but knew, of course, that his wells were being gauged, which would put him on his toes to get all production possible, to the extent, possibly, of some over pumping. In this case there is no intentional stripping. As Figure 7 shows, the power required averaged a little over half a kilowatt per barrel of fluid raised, or in this case almost .8 of a kilowatt per barrel of oil. With 2-cent power, this would amount to about 1.5 cents per barrel of oil. If the wells were stripped more, or if the ratio of water to oil were greater, the cost would rapidly rise.

An examination of the curves drawn by the graphic kilowatt meter discloses much interesting information regarding the power requirements throughout the pumping cycle. The hooking on of one additional well to the power when well balanced under particular circumstances would be sufficient to throw the balance far enough out to place an overload on the motor during a small portion of the cycle. In fact, it is so difficult to maintain the power in balance, that owing to the necessity of pumping each well according to its needs, it is safe to say that almost all the time an operating power is far out of balance. The best we can do is to so arrange the angle of rod line approach that when the load is heaviest the best balance is obtained, and then leave the rest to the good judgment of the pumper.

In Figure 8 will be found a graphic representation of a badly balanced power. Here the load varies from full load, or about 30 horsepower, to a feed back to the electric system of five or more horsepower, and this with just six wells hooked on. However, no portion of the system is overloaded, so that this condition is safe for continuous operation. As the pen of the meter describes an arc across the sheet, the graphs are distorted accordingly, and for this reason the true base lines are given. The estimated feed back is shown as dotted lines, as the meter will not record below zero. The

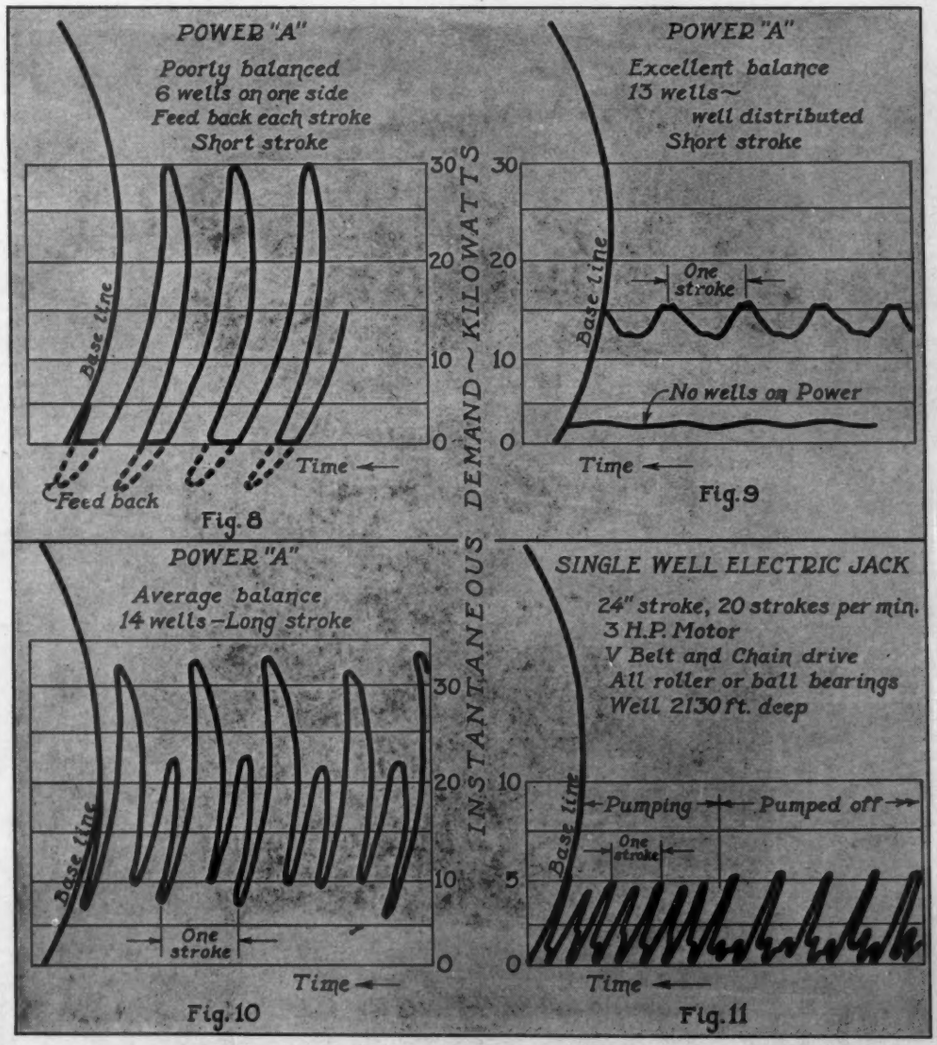

Fig. 8—Graphic representation of a badly balanced power. Fig. 9—Excellently balanced power with well distributed short stroke. Fig. 10—Average balanced condition with the power operating on the long strokes. Fig. 11—Operation of a single well pumping jack equipped with a 3-horsepower motor and a well adjusted counterbalance

BUILT FOR

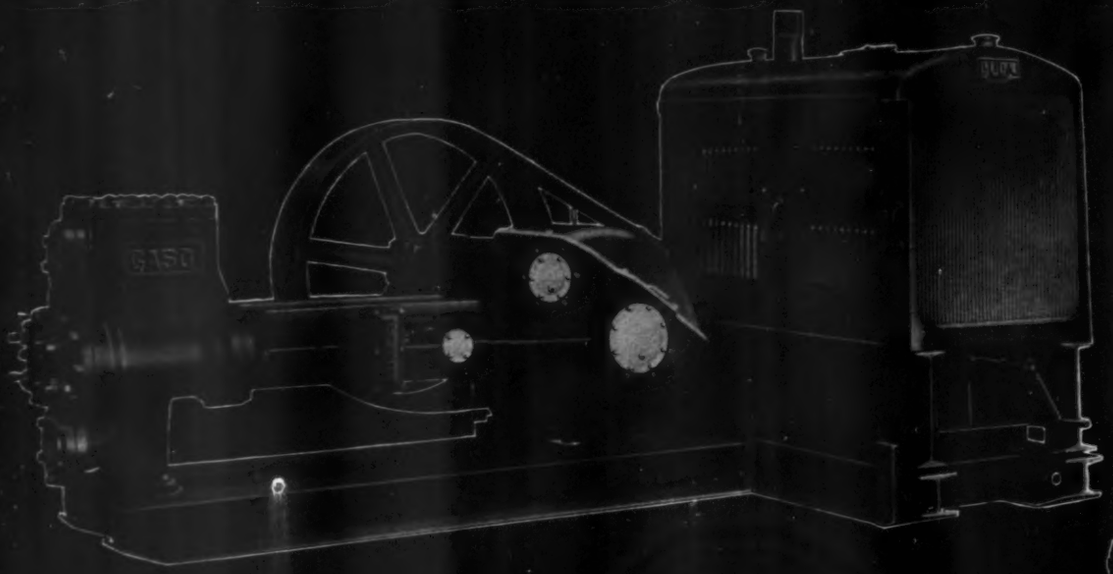

FIG. 1740
Gaso Duplex Piston
Pump, Gasoline Engine
Drive—54 to 250 Bbls.

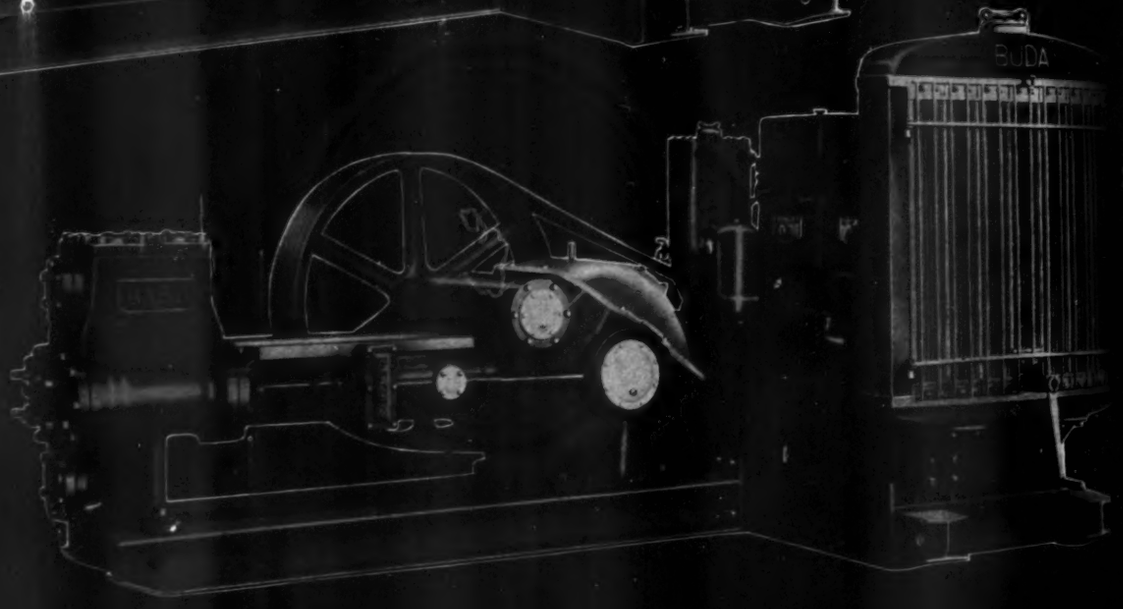

FIG. 1741
Gaso Duplex Piston
Pump, Diesel Engine
Drive—250 to 502 Bbls.

FIG. 1742
Gaso Duplex Piston
Pump, Electric Motor
Drive—54 to 250 Bbls.

RPIPE LINES

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Gaso Portable Pumping Unit—Gasoline Engine Drive—63 to 475 Bbls.

FIG. 601
Gaso Walking Beam Pump—30 to 55 Bbls.

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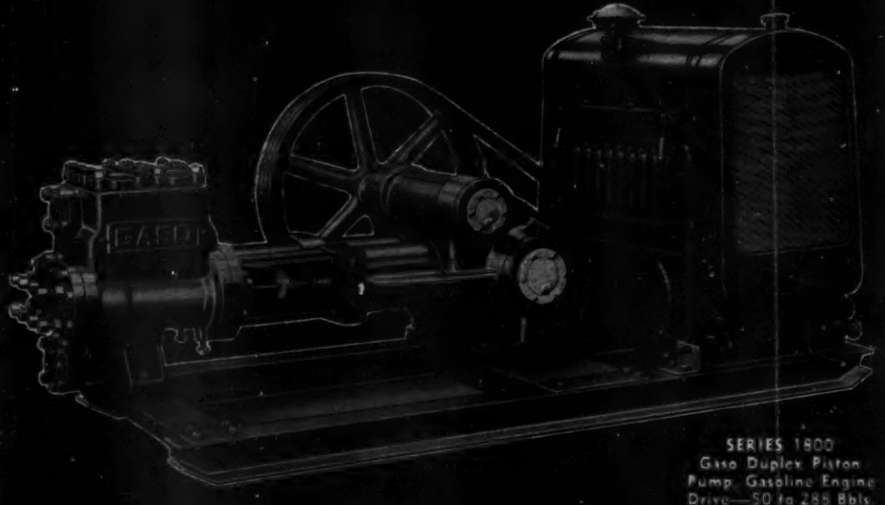
FIG. 301
Gaso Piston Power Pump—32 to 158 Bbls.



SERIES 1600
Gaso Duplex Piston Pump, Gasoline Engine Drive—50 to 285 Bbls.

GASO PUMPS

best balanced condition obtained on the short stroke is represented in Figure 9. Even here a considerable variation will be noted, but very slight when compared with Figure 8. It will be noticed too that the maximum demand for 13 wells in Figure 9 is about 16 kilowatts as compared with 30 kilowatts for six wells in Figure 8.

In Figure 9 will also be found the graph for the power with no wells hooked on. The slight variation in demand throughout each stroke is due to the fact that the power is set at an angle of 15 degrees, and the weight of the crank and crank disc increase the load as they travel uphill. The chief interest in this curve lies in the evidence it furnishes of the extreme delicacy of the measuring and recording apparatus.

Figure 10 shows what might be termed an "average pumping condition," although the shape of the curve will vary greatly with each different combination of wells hooked on. In this case there is a slight overload at one point of each stroke. This graph was plotted with the power operating on the long stroke.

As a matter of comparison, Figure 11 is included to show the operation of a highly efficient single well pumping unit equipped with a 3-horsepower motor and a well adjusted counterbalance. It will be noted that the well is deeper than those pumped from Power "A" and that the polish rod stroke is longer, and that the well pumps more rapidly. In this case there are two "humps" in the curve for each stroke, one in which the oil is being lifted, the other when the counterweight is rising. With these humps of exactly the same height, the well is perfectly balanced. It is interesting to note how the load is thrown out of balance when the well is pumped off. This is due to the fact that on the down stroke the weight of the column of oil, which is taken by the standing valve before the well was pumped off, is now taken by the traveling valve, and consequently assists the motor in raising the counterweight, thereby lightening the motor load as the counterweight rises. It will be noted, too, that twice each stroke, when raising fluid, there is a momentary overload on the motor, but since the extent of the motor heating is determined by the average load, this will cause no harm. The jack is designed to accommodate this greater load.

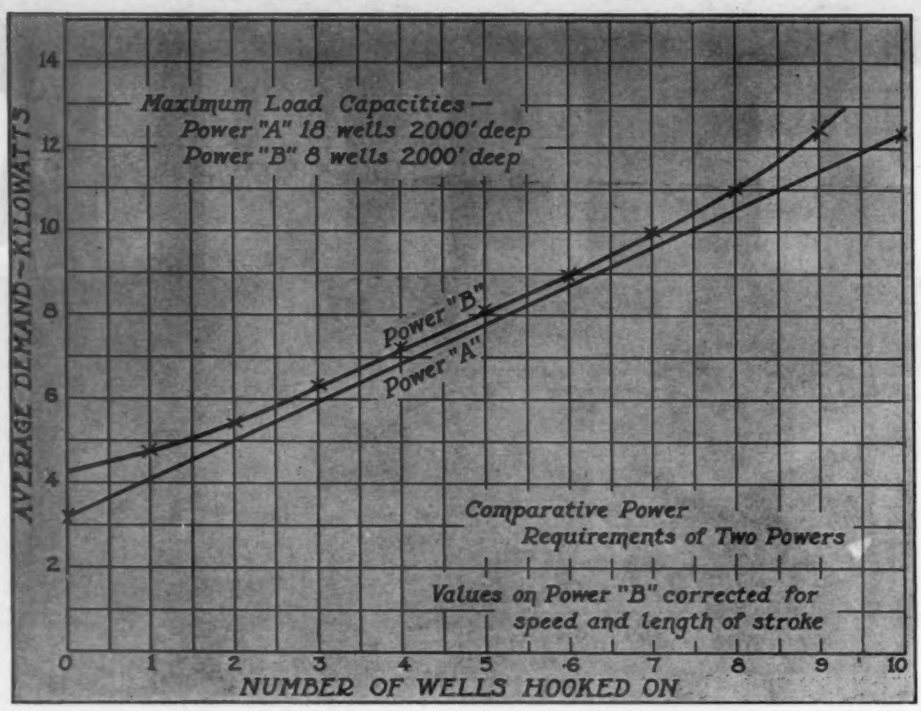

Maximum Load Capacities—
Power "A" 18 wells 2000' deep
Power "B" 8 wells 2000' deep
Power "B"
Power "A"
Comparative Power
Requirements of Two Powers
Values on Power "B" corrected for
speed and length of stroke
AVERAGE DEMAND—KILOWATTS
NUMBER OF WELLS HOOKED ON
0 1 2 3 4 5 6 7 8 9 10
2 4 6 8 10 12 14

Fig. 12—Comparative power requirements of Powers "A" and "B" with the values of the latter being corrected for variations in speed and length of stroke from those on Power "A"

FIGURE 14—RELATIVE EFFICIENCIES OF THREE POWERS

	Kilowatts demand per well			Ratio of demand	
	Power "A"	Power "B"	Power "C"	Power "B" / Power "A"	Power "C" / Power "A"
Full load	1.133	1.375	1.232	1.235	1.09
Half load	1.248	1.360	1.232	1.42	.98

The power measurements made on Powers "B" and "C" were for the purpose of determining the relative efficiency of these machines, especially when compared with a power in which every effort had been made to eliminate friction. In the case of Powers "B" and "C," power consumption measurements were made with all wells hooked on, and then after each well had been removed, one at a time, down to one well on each eccentric. As these are both eccentric powers, without bars to prevent the turning of eccentrics, no load readings could be obtained directly, but have been determined by extrapolating the load curve to the no load point.

Powers "B" and "C" both have speed and average polish rod stroke differing from Power "A," as might be expected. In the results reported on Power "A" it was shown that power requirements varied in direct proportion with the length of the stroke. While this same relationship may not hold accurately true for speed variation, in the absence of experimental evidence, it seems reasonable to assume it to be correct for practical purposes over small variations in speed, especially on this slow moving machinery.

Power Requirements

In comparing power requirements for the three powers, therefore, the measured values on Powers "B" and C" have been corrected for variations in speed and stroke from those found on Power "A," and the results are shown in Figures 12 and 13. In each figure the power curve for Power "A" is included for reference. From these curves it is obvious that, when pumping the same number of wells, both "B" and "C" require more power than does "A." However, the full load rating for these powers are different, so that the table shown in Figure 14 is included, in order that the comparison may be more accurate. From this it will be seen that Power "A" is almost 25 per cent more efficient than Power "B" at full load, and almost 10 per cent better than Power "C." At half load,

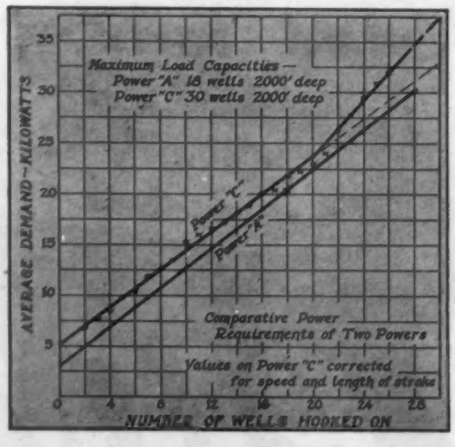

Maximum Load Capacities—
Power "A" 18 wells 2000' deep
Power "C" 30 wells 2000' deep
Power "C"
Power "A"
Comparative Power
Requirements of Two Powers
Values on Power "C" corrected
for speed and length of stroke
AVERAGE DEMAND—KILOWATTS
NUMBER OF WELLS HOOKED ON
0 4 8 12 16 20 24 28
5 10 15 20 25 30 35

Fig. 13—Comparative power requirements of Powers "A" and "C," the values of the latter also being corrected for variations

which is also important, since powers run much of the time at partial loads. Power "A" takes little more than two-thirds of the power requirements of Power "B" per well at half load, but Power "C" at half load is very slightly more efficient.

At 2 cents a kilowatt hour, the cost per hour for pumping each well would vary from about 2¼ cents at full load on the most efficient power to about 5 cents using the bandwheel power at 20 per cent load or less.

The shape of the curves in Figures 12 and 13 throws some interesting light on the effect of loading on the various powers. For all practical purposes, the curve for Power "A" is a straight line. This would indicate that the friction load is either constant throughout all loadings of the power, or that there is a constant increase in friction load directly proportional to external load. The former condition seems to the writer to be the more logical under the circumstances. That would mean that there is no practical increase in friction load in the power as the external load is increased, an excellent condition. It would also suggest that the manufacturer's full load rating is conservative, which, is important to producers.

In the case of Power "B," when more than six wells are pumped at one time, the increase in power required per additional well becomes greater. This can only mean that the internal friction is increasing, due, it would seem most likely, to weaving of parts of the machine, not a wholesome condition. The power seems to be "stiff," too, at very light loads. In operation the eccentric ring has a tendency to jump a little when lightly loaded, although lubrication under all conditions seems to be quite adequate.

The curve for Power "C" suggests a very considerable increase in friction as the power is loaded beyond 21 wells, and with 30 wells hooked on this increase in friction amounts to almost 5 kilowatts, a lot of heat to dissipate. This must result in a considerable warming up of the power, and such is often noticed in practice.

From all this work, it is evident that the power requirements for well pumping are directly proportional to the number of wells pumped, and that balancing a power has no practical effect on such requirements, however important it may be in reducing strains in pumping machinery, and in enabling a power to handle the maximum number of wells safely. It is also indicated that perfect balancing is not likely to exist in practice, and that most all of the time a power if far out of balance, even though it may appear to be running smoothly. This does not mean that a pumper should not bend every effort to keep his power balanced the best he can. In fact, it seems important that considerable effort be expended to enable the pumper to keep his power seemingly balanced, especially with the older type machine, and then to see that he does it, if for no other reason than to minimize the strains on the machine and its foundation. The writer has frequently found it desirable to install recording ammeters on the powers to promote this objective, and he was much interested to find a similar installation on a power in Trinidad, in a place where the value of the electricity, generated from waste gas, was insignificant.

In the accumulation of this data, the writer was assisted greatly by H. J. Bannon of Bradford, Pa., and here wishes to express his appreciation.

Deeper Drilling on Gulf Coast Makes Necessary New Control Methods

By NEIL WILLIAMS

Development of increasingly deep producing horizons, with correspondingly increased bottom-hole pressures, has introduced new drilling control problems in the Gulf Coast. This fact, together with an awakened consciousness on the part of operators that well blowouts occasion excessive waste of formation pressures in addition to inevitable damage to rigs and drilled hole, has led in the Gulf Coast area to the adoption in the past year of new practices with reference to blowout prevention, methods for prompt and effective subjugation of kicking well pressures, and constant maintenance of pressure control at the surface.

Although wild wells were noticeably fewer in number in the Gulf Coast area during 1935, as compared with previous years, some of the deeper wells which did blow out confronted operators with serious and costly capping problems. Moreover, heightened appreciation of the value of conserving natural formation pressures, and thus extending the flush life of any given field, has more and more led to severe frowning upon that luckless operator who through carelessness, or lack of control equipment, permits a well to get out of control and blow wild.

Evolution of the new practices has been influenced by several factors. Perfection of drilling mud control methods, enabling operators safely to carry ever increasing footage of open hole below surface casing, has led to exposure of drilling wells to blowouts from various sands encountered on the way down. Frequently upper or intermediate depth sands are passed up as incapable of making the most productive well, but nevertheless they constitute sources of continuous danger from blowouts until casing has been run and cemented. These types of sands are frequently encountered in Gulf Coast wildcats, and even in many proven fields where irregularities in producing formations develop. Many operators, in drilling wildcat wells on previously undeveloped prospects, plan in advance to run their oil strings from top to bottom, selectively perforating the casing opposite sands from which it is desired to produce.

Another factor which has weighed heavily in the development of methods and in the design of newer types of drilling control hook-ups is the difficulty involved in subduing an unruly well pressure when drill pipe is any considerable distance off bottom of the hole. Obviously, the mud column can be increased in weight only from the water course holes of the drilling bit to the top of the hole—unless, of course, provision has been made in the drilling manifold to reverse circulation, and this is very seldom done.

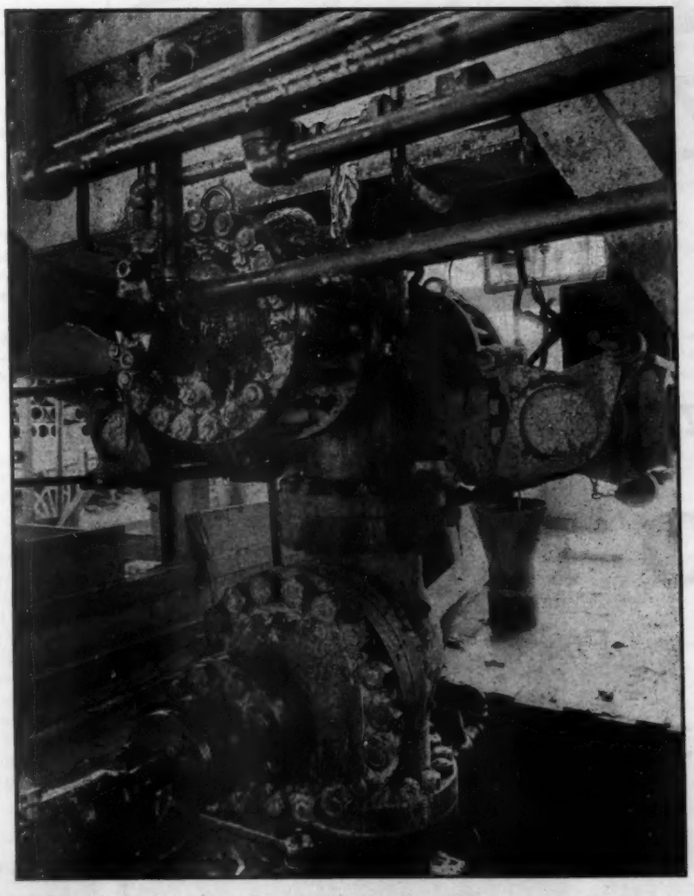
A further serious problem confronted in fighting to control a well which is tending to blowout, is to prevent sticking of the drilling string while circulating to increase weight of the fluid column. To overcome this additional hazard, which has proved tremendously expensive in past years, provision is made in the new drilling control hook-ups which permits constant rotation of the drilling string, as well as slow raising and lowering between tool joints. This continuous movement of the pipe very largely overcomes the tendency of the drilling fluid to channel, which in turn keeps cuttings moving out of the hole instead of permitting them to settle over the drill collar and bit. The drilling superintendent for a major company recently estimated that previous inability to move the drilling string continuously while fighting well pressures had caused his company approximately $100,000 in fishing jobs in the past four years. Viewed in the light of the flourishing business done by cutting tool and fishing tool men, it is probable that this statement is not exaggerated.

Effectively, to cope with these three major problems, which arise largely as a result of deeper drilling, producing company engineers, in collaboration with equipment company engineers, have worked out radically new types of control hook-ups which provide means of dealing with each of the problems.

To combat the explosive type of blowouts which originate in upper or intermediate pressure-bearing formations, ingenious new packing devices have been devised as improvements to existing well control equipment. In addition, almost all blowout preventers are now actuated by one or another form of pressure, thus insuring swift closing and positive sealing of the annular space between drill pipe and casing. Pressure closing of blowout preventers has, also, introduced remote control of the preventer units, thus giving well crews greater confidence in their ability to combat the highest well pressures without excessive personal danger. Although this factor of crew confidence has received almost no discussion, conversation with any typical crew in a high pressure area will reveal that it has been a very solid contributing factor in reducing total number of destructive blowouts.

The problem of effectively over-balancing a kicking pressure with weighted mud, especially when drill pipe is considerably off bottom, has gone far toward causing the widespread adoption of multiple-unit drilling control hook-ups. When a well kicks out, for instance, when 3,000 feet or 4,000 feet of pipe has been pulled from a 7,000-foot hole, two tasks confront the drilling crew. The first, of course, is to close the well in. This is relatively simple with virtually any standard unit of well control equipment. The second problem is to regain control over the kicking pressure and resume normal drilling operations as quickly as possible. As was pointed out by an engineering committee appointed by one major company to make an exhaustive study of drilling control methods, this is frequently difficult to do, even with the heaviest drilling mud possible to mix with commercial weighting materials. This oft recurring difficulty led this same committee of engineers to recommend the development of a control hook-up which would permit lubricating the drilling string safely back to bottom, so that the weight of the entire column of drilling fluid could be increased uniformly and provide a hydrostatic head sufficient to permit resumption of drilling.

Several types of drilling control hook-ups which permit drill pipe to be lowered in the hole safely against pressure are now in common use in the Gulf Coast. To some extent the type of hook-up employed varies with the area in which drilling is being done, and the pressures likely to be encountered. One type of hook-up employes a ram-type preventer unit on the well casing, above which is installed a preventer of the self-sealing packer type. Or, a drill-pipe stripper may be employed above the ram-type preventer. A second hook-up consists of a ram-type preventer on the casing, with a combination drilling head mounted just below the rotary, this head being equipped with dual means of sealing off around the drill pipe. In each of these hook-ups



Drilling control hook-up illustrated above, while not actually typical of the majority of hook-ups used in the Gulf Coast, illustrates the extensive use of control units in dangerous high pressure areas. This hook-up consists of an 11¾" drilling-through gate valve; a ram-type, pressure operated blowout preventer through the closed rams of which drill pipe may be raised, lowered, or rotated; a Hosmer Type head installed above the ram-type head; and, above these units, a double-seal drilling-through head. The last two named units are concealed by the rotary support beams

wear occasioned by moving the drill pipe down against pressure is concentrated on the upper units, reserving the lower unit for emergency seal should it become necessary to replace packing elements in the upper units.

A third type of hook-up consists of two ram-type units equipped with special packing elements, through which drill pipe may be passed safely by alternately opening and closing the rams of the upper and lower units to pass tool joints. In this hook-up, also, wear occasioned by passage of pipe through the sealing elements is concentrated in the upper preventer unit, thus reserving the lower unit for emergency seal while packing element is renewed in the upper unit. In as much as virtually all of the newer types of control units are pressure operated, the process of lowering a string of drill pipe does not consume an unreasonable amount of time. Furthermore, freedom on the part of the operator to resort to this measure enables him to get his rig back making hole in the shortest possible time.

Almost all of the new hook-ups include a drilling-through valve in the assembly, as a means of closing the well in when pipe is out of the hole, or, in extreme emergency, as a means of closing the well after dropping the drill stem, should this become absolutely essential. The valve is also serviceable in closing the hole while repairs, changes or alterations are being made to the flow-line or fill-up line manifold.

Measures taken to provide a means of lubricating drill pipe back to bottom have led to the development and perfection of sealing means which also makes it entirely practical for an operator, while circulating to regain control of his well, to rotate his drill pipe constantly and raise and lower it between tool joints to prevent sticking. Many instances are already of record in which this new latitude has saved days of lost time on fishing jobs. Unquestionably, this development represents a decidedly major advancement in the evolution of means of reducing drilling costs and delays.

While developing the improved drilling control hook-ups to protect the main well bore, considerable attention has also been given to the provision of equipment on the flow-line which affords equally swift and positive shut-off in case of a blowout. Fast-closing valves of the conventional type; plug valves with geared compounding arrangements to facilitate their closure against high pressures; and pressure-operated valves which work simultaneously with the blowout preventer units have been developed and placed in widespread use. These, too, have contributed substantially to the noticeable reduction in number of blowouts in the past year. Especially is this discernible when it is recalled that a number of the Gulf Coast's worst blowouts were occasioned not by blowout preventer failure, but failure of flow-line or fill-up line connections.

In the flow-line manifold, there is an increasing tendency to provide not one, but two choke outlets through which to hold a back pressure on a kicking well while circulating to regain control. The provision of two outlets, each with a choke ahead of a high-pressure gate valve, obviates the necessity of shutting down the pumps to change chokes when only a single choke outlet is included in the manifold. Now, the discharge from the flow-line manifold may be switched instantly, and a damaged choke nipple changed while discharge of mud fluid is continued through the auxiliary choke.

Virtually the only weak point yet remaining to be provided for in the latest types of Gulf Coast drilling control hook-ups is a convenient and practical means of closing the fluid passage through the drilling string itself. In case of a blowout while coming out of the hole, the drill pipe is uncovered, and to date the only provision being made in general practice is to keep a safety-joint handy on the derrick floor. While it is possible for a crew to stab a safety-joint in the drill pipe even when the well is blowing with considerable force, it is neither possible nor practical when pressures blowing exceed 600 or 800 pounds. And, in any event, the procedure involves considerable personal risk to individual crew members. It is true that kelly-cocks have been devised and, in a small way tried out, but no generally satisfactory provision for closing the drill pipe has as yet been perfected.

In proven fields, where formation pressures are fairly well known, and where producing horizons have been charted, there is one possible and interesting outcome of the new drilling-control hook-ups which had not been generally considered until a venturesome drilling contractor tried it in the Corpus Christi area recently. This operator, equipped with one of the latest type, full-pressure operated hook-ups, in which he had absolute confidence, drilled a contract hole five days faster than similar depth holes had been drilled in the area. His method was to use a very thin drilling fluid while actually making hole, fluid of a weight just sufficient to build a wall to his hole as it was cut. The use of thin drilling fluid washes cuttings from the bit more effectively, and hence permits faster cutting of hole. When the bit became dulled, this operator had his drillers thicken the column of mud by the simple expedient of cutting off additions of water, thus permitting mud to mix itself in the hole and thicken the column. An hour of mixing gave him a column of sufficient weight to permit a normally fast trip out of the hole and back again to bottom, having reached which water was again turned into the drilling fluid in a steady stream. Although this practice is frowned upon extensively, there is a reasonable possibility that, under certain conditions, it may develop considerable acceptance as a standard practice.

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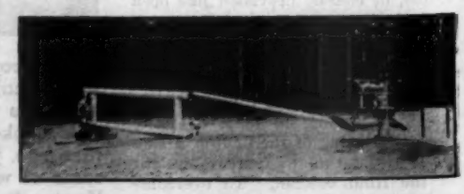


High pressure water knock-out on individual well in Rodessa field equipped with 1,200-pound automatic float control

Treatment of Waters and Brines for Flooding and Disposal Purposes

By A. C. EMBSHOFF
International Filter Co.

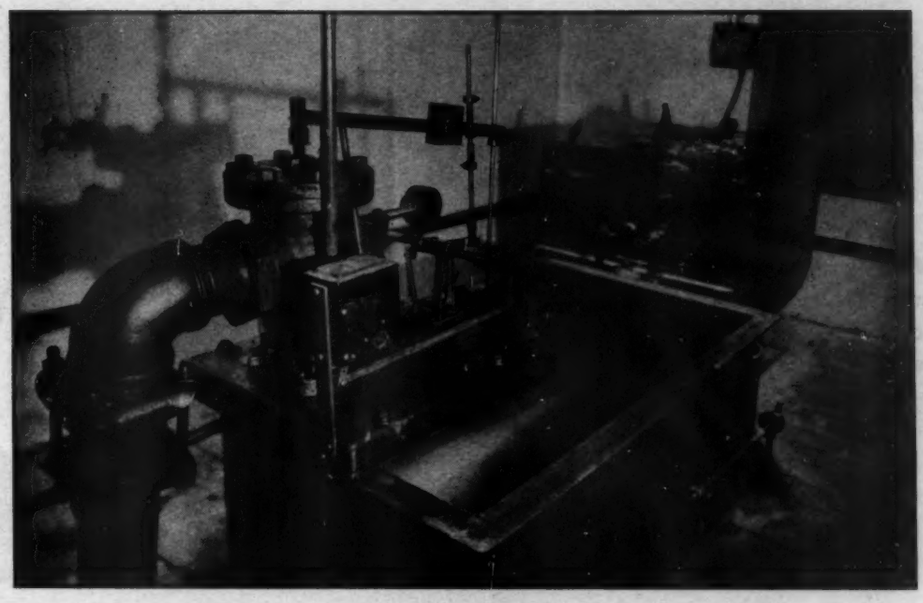
The treatment of water or brine for the flooding of oil sand, and the treatment of brine for disposal in underground formations, present essentially the same problems.

The oil sand into which the water or brine is introduced to displace the oil and the formations into which the brine is pumped for disposal are more or less porous structures; and even where there is a high degree of porosity, the pores—as a rule—are very small and in many cases ultramicroscopic in size.

This being the case, it is obvious that the water or brine must be free from matter which will clog the formation if intake of water or brine under reasonable pressures over a considerable period of time is to be secured. And, since piping systems required for delivery of the water or brine to point of application are extensive—and expensive—the condition of the water or brine should be such that corrosion or scaling of the distribution systems will be prevented.

At first thought, it would appear that the requirements could be met by proper clarification of the water or brine to remove from it material in suspension which would obviously deposit in pipe lines and plug the formation; and, in some cases, this is all that is necessary.

In other cases, even though the water or brine appears clear and free from suspended matter, it may contain dissolved substances which on contact with air are precipitated—such as iron oxide; and when dealing with waters or brines from underground formations, reduction in pressure and handling with resultant contact with the air on reaching the surface liberates a portion of the free carbon dioxide usually contained in such subsurface supplies. This liberation of free carbon dioxide may disturb the chemical equilibrium of the calcium bicarbonate—which is usually present—to such an extent that the liquid becomes supersaturated with calcium carbonate and, in consequence, calcium carbonate is precipitated.



Chemical feed and water control apparatus installed in the water stabilizing plant of an Eastern field oil company, the vat being used for mixing chemicals with the water

Unfortunately, the precipitation of calcium carbonate from a supersaturated solution is not an instantaneous thing. It is perfectly possible to coagulate and filter a supply so that it will be brilliantly clear on leaving the filter but which, because of calcium carbonate supersaturation, will subsequently become turbid due to the precipitation of the calcium carbonate as the water or brine flows through the distribution lines. The calcium carbonate thus precipitated will accumulate in the distribution lines and plug the formation.

This being the case, it follows that water or brine to be used for flooding purposes, or brine which is to be disposed of in underground formations, must be not only bright and sparkling clear but stable, as well.

A stable water or brine may be defined as a solution which is in chemical equilibrium: i.e., a solution which will not develop a precipitate, nor corrode the distribution piping, nor form a deposit in either the piping or underground formation.

Many water used for flooding purposes, and practically all brines, contain more or less iron in solution as well as calcium bicarbonate; and, some may contain hydrogen sulfide. The simples method of removing iron from water or brine is by aeration, for oxidation and precipitation of the iron, followed by filtration. And, of course, in this process any turbidity which may be present will also be removed.

In the process of aeration, hydrogen sulfide and free carbon dioxide are released. Elimination of the hydrogen sulfide is necessary to prevent piping corrosion. Release of a considerable portion of the free carbon dioxide is a very desirable feature where the water or brine is definitely undersaturated with calcium bicarbonate, because this release may bring about calcium carbonate equilibrium. In this event, the aeration necessary for oxidation and precipitation of the iron and elimination of hydrogen sulfide serves also to bring the water or brine into chemical equilibrium; and after filtration, for removal of precipitates resulting from aeration, such water or brine

Interior view of a filtration plant located in the Bradford, Pa., field in which flooding-waters are treated and filtered before being pumped to the water input wells

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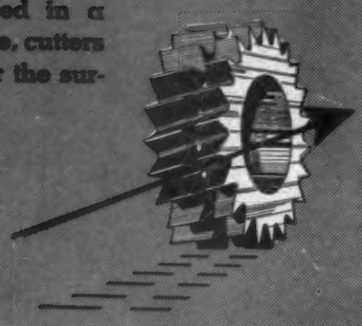

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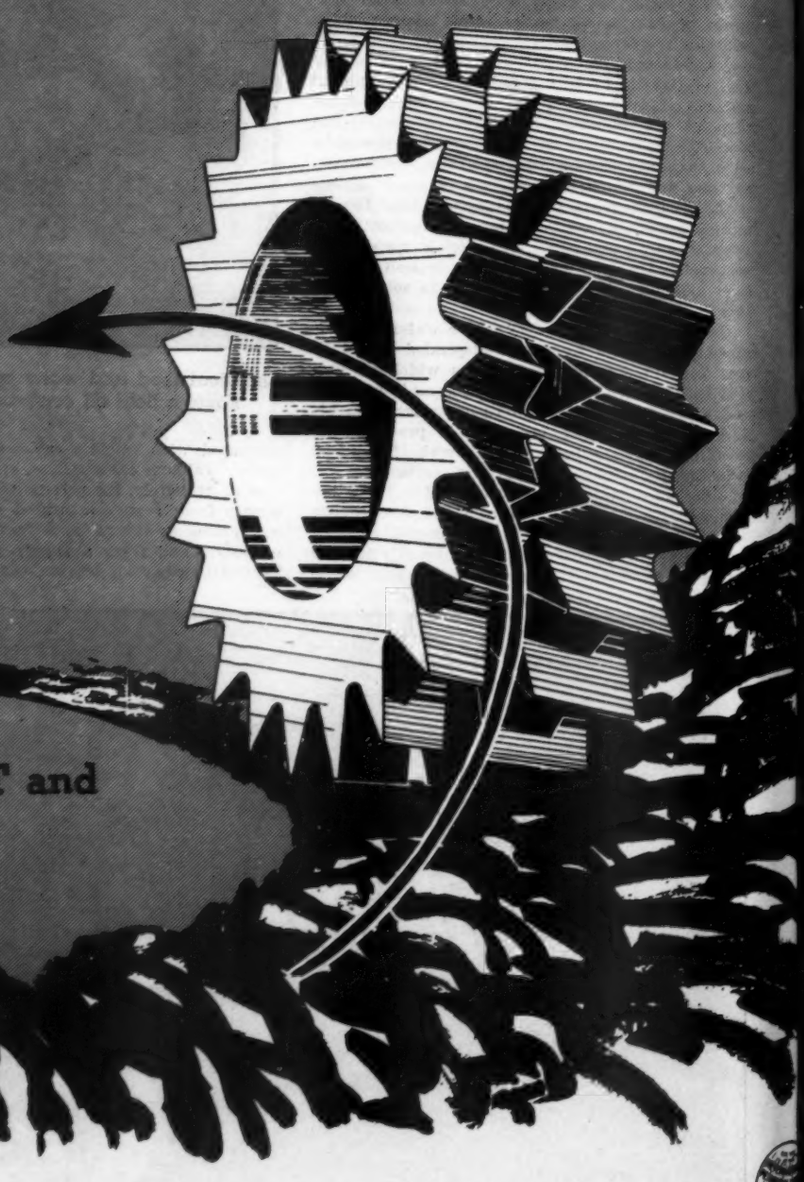

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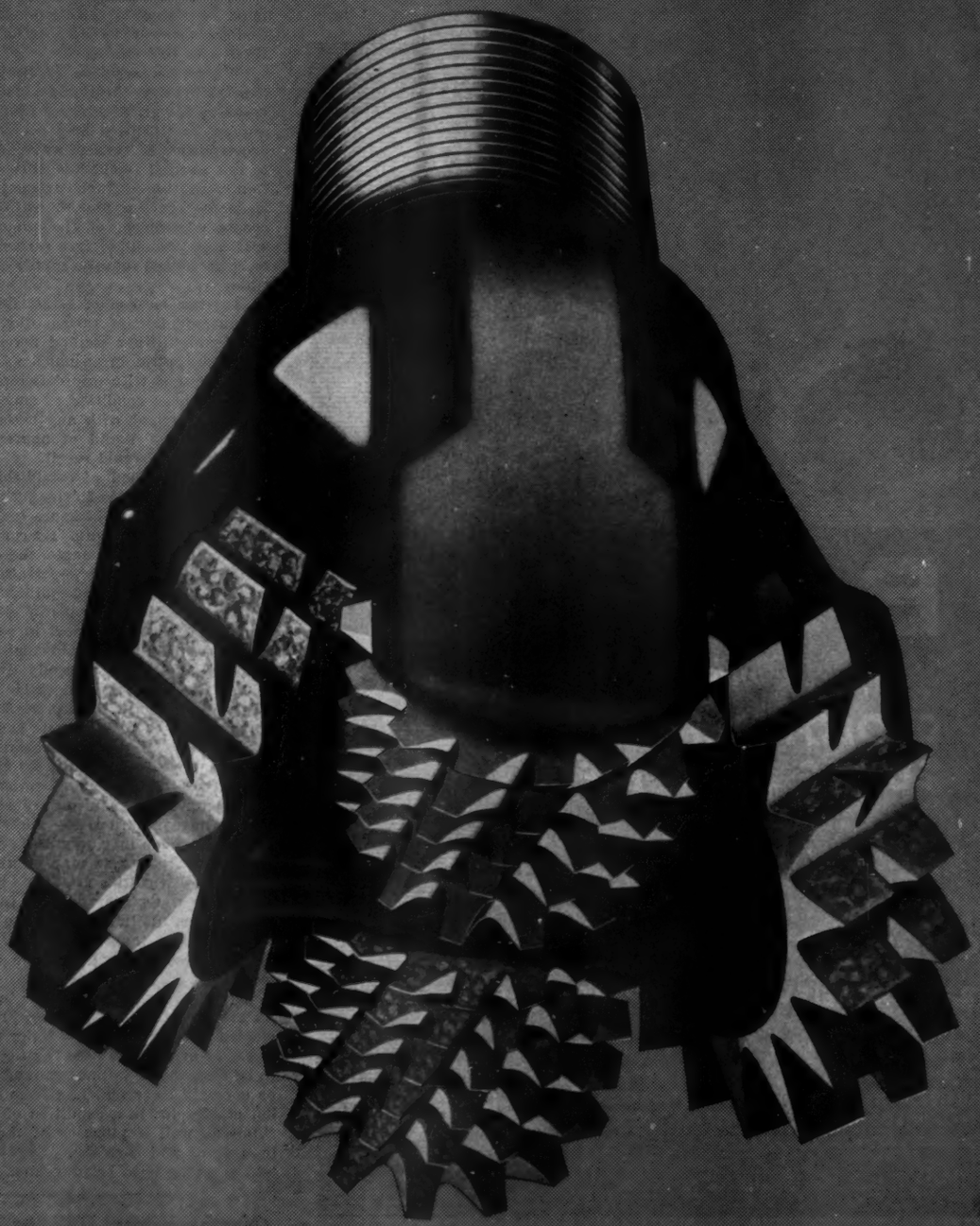

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is entirely suitable for flooding or disposal purposes.

In a considerable number of cases, however, release of carbon dioxide causes the liquid to become definitely supersaturated with calcium carbonate. Then, unless the treatment is such as to reestablish equilibrium or chemical stability, the filtered liquid will not remain clear. A water or brine in this condition will cause difficulties from deposit in the distribution piping and plugging of the formation.

Another possibility is that the water or brine after aeration and despite liberation of free carbon dioxide may still be undersaturated with calcium carbonate; and such a liquid will be corrosive to the distribution piping and the resulting products of corrosion will form a precipitate in the liquid. A water or brine in this condition is therefore open to the objections that it causes deterioration of the distribution system through corrosion, and plugging of the formation with products resulting from this corrosion.

The category in which any particular water or brine falls can only be determined by a complete chemical analysis and physical examination.

The chemical analysis will show whether the water or brine contains hydrogen sulfide or iron for the removal of which aeration will be necessary; whether the liquid is in chemical equilibrium, supersaturated or undersaturated with calcium carbonate; and will indicate whether aeration, with release of additional free carbon dioxide, will result in equilibrium, supersaturation or undersaturation. The physical examination shows, of course, whether the water contains suspended matter which should be removed by coagulation and filtration.

These facts having been determined for the water or brine in question, the necessary information is at hand to prescribe a treatment for overcoming the objectionable characteristics.

If the water or brine is substantially in equilibrium and contains no hydrogen sulfide and little or no iron, then simple coagulation and filtration will provide a water or brine satisfactory in quality for the purposes under discussion.

On the other hand, if the liquid contains hydrogen sulfide or iron in solution—or both—so that aeration is necessary for removal of the former, and for oxidation and precipitation of the latter, consideration must be given to the effect of this aeration and the attendant release of free carbon dioxide on the equilibrium of the liquid. In some cases, the aeration required may bring an undersaturated liquid into equilibrium. In other cases, this aeration may result in supersaturation with respect to calcium carbonate. In still other cases, even after aeration, the liquid will be undersaturated with respect to calcium carbonate and therefore corrosive to the distribution piping.

Where the latter condition exists, an alkali must be added to the liquid subsequent to aeration and previous to filtration in order that equilibrium may be established.

Where the aeration results in a condition of supersaturation, the liquid must be stabilized previous to filtration in order that precipitation subsequent to filtration may not occur. This can be accomplished in various ways. Acid may be added to the aerated liquid and this acid through reaction with the calcium carbonate present will release free carbon dioxide within the liquid. By proper adjustment of the amount of acid fed, a sufficient amount of free carbon dioxide can thus be reintroduced into the supply to establish equilibrium.

Another method of establishing equilibrium is the introduction of carbon dioxide, as such, into the liquid. Either method necessitates very close chemical control in as much as it is immediately apparent that with any deficiency in acid or carbon dioxide, a condition of supersaturation would still obtain; and with any excess of acid or carbon dioxide, a liquid of aggressive or corrosive characteristics would result.

A third method of establishing the necessary equilibrium consists of bringing the supersaturated water or brine into intimate contact with precipitated calcium carbonate. By contact with the precipitated calcium carbonate, the calcium carbonate in the water causing supersaturation is precipitated and a condition of equilibrium is established. This last-mentioned means of establishing equilibrium is the most practical in as much as its use cannot result in under or oversaturation; and when properly applied in correctly designed equipment assures the delivery of a stable water or brine.

On the basis of the preceding remarks, it is obvious that there is no one method of treatment applicable to all water or brines to render them suitable for flooding purposes or for disposal in underground formations. Some supplies require no treatment; some require only clarification; some may require aeration, the addition of alkali and filtration; some may require aeration followed by filtration; and others may require stabilization if operating difficulties are to be avoided. Whether or not treatment is required can only be determined when all the facts in the case are known; and when the facts are known proper treatment can be prescribed and suitable equipment recommended.

Several years of experience in the treatment of waters for flooding purposes have proven conclusively the soundness of the statement that a water or brine to be used for flooding purposes, or to be disposed of in underground formations, must be not only clear and free from suspended matter but stable—i.e. in a condition of chemical equilibrium—as well if plugging of the formation is to be avoided and corrosion or scaling of the distribution piping is to be prevented.

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EDMONTON, Ontario, May 9.—Northwestern Utilities, Ltd., supplying Edmonton with natural gas from the Viking field, had a gross revenue in 1935 of $986,589.56 against $839,145.71 the previous year. The company's annual report states gas supplies in the Viking field and reserves in the Kinsella field are adequate for many years.

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Fundamentals of Solvent Refining of Petroleum Substances

By JOHN W. POOLE
Consulting Technologist, Scotch Plains, N. J.

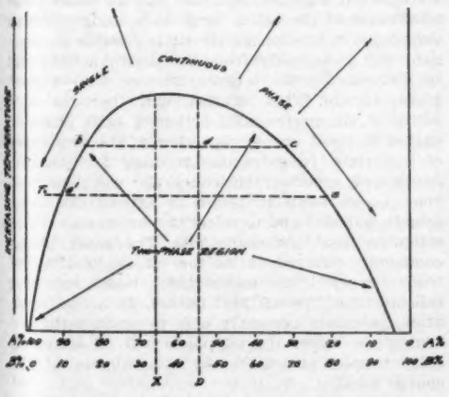
A.P.I.—Presented Mid-Year meeting of American Petroleum Institute, Tulsa, May 14, 1936.

This paper has not been compiled for the purpose of describing any recent and important discovery in the art of solvent refining. Its purpose is, rather, to provide in as simple a manner as possible an exposition of certain basic principles which everyone concerned with the operation of commercial extraction processes must keep in mind. It is written primarily for the petroleum engineer and technologist whose field of activity has been principally elsewhere — although, even as the writer has profited by actually putting these simple basic principles in ink, so may others, who are sophisticated in the art, profit by a review of facts which subconsciously they recognize.

Physical Chemistry as It Relates to Solvent Refining

By and large, he who is concerned with technology involving solutions of which both solvent and solute are liquids will deal almost exclusively with organic substances. Petroleum refining is no exception; and in the comparatively new art of solvent refining of lubricating stocks the field, as heretofore, continues to be one for organic and physical chemistry—or possibly better—for organic physical chemistry.

As in other branches of organic chemistry, that portion which merges with the more general aspects of physics has not been reduced to a point even remotely approaching the definite knowledge which we possess in the inorganic field. Within comparatively recent years our knowledge of inorganic, ionized solutions has become codified, and reduced to a comparatively small number of broad principles which, if not supplying the entire story,



Phase Diagram for Two Hypothetical Liquids.

FIG. 1

come vastly closer to so doing than is possible for organic solutions.

Therefore, at the present state of our knowledge, we may now turn to a few mathematical formulas and produce therefrom a deductive treatise whereby may be described the actions of such solvent effects as take place in a modern extraction plant for the production of superior lubricants. The writer believes that it will be most clearly understood by all if these effects are described by direct illustration; and, starting at the beginning, let us first suppose that in two separate utensils we possess quantities of two pure liquid substances, and that we refer to one liquid as "A" and to the other as "B."

In general, temperature permitting, the following sequence of events can take place: We shall first regard "A" as the "solvent" or substance in which another substance is to be dissolved; and "B," the "solute," the material which is to be dissolved in or dispersed throughout the solvent "A."

If "B" is slowly poured into "A," which is meanwhile well agitated to produce intimate contact, it will be found that for some time "A" will remain clear and bright with no evidence of a second coexisting phase. Eventually, however, "A" will become saturated with "B," and the addition of further "B" will cause the solution to appear murky as an incipient second phase appears. If we add more "B," there will be no further increase in the volume of the "A" phase, but all additional "B" will go to increase the volume of the newly-formed "B" phase. Actually, there will be a decrease in the volume of the "A" phase, for the following reasons:

If originally we had chosen to pour "A" into "B" instead of vice versa, the entire above description would still have been exact, provided only that, in the description, the terms "A" and "B" were substituted for each other throughout. To be sure, the second phase would probably appear at different quantities of added solute, but otherwise there would be nothing to differentiate between the two procedures. This dual function of both fluids is a point which can easily be overlooked, although it is known to all who are possessed of a good general knowledge of physical chemistry: The fact that each substance may act—and usually does—as both solvent and solute frequently renders valueless and study which is predicated on the existence of one solvent only and one solute dissolved therein. This is especially true when a third substance soluble in either solvent is present. Careless thinking can also lead to incorrect material balances by forgetting that an excess of the presumed solute causes the arbitrarily named "solvent phase" to decrease in volume by dissolving a portion of the solvent which, in consequence, reduces the amount of solvent available to dissolve the solute, which thereby is precipitated to join the "solute phase," and carry with it as much solvent as is necessary to saturate the precipitated solute.

In the light of the above, it might appear offhand that the effect of adding a quantity of one of the substances would result in a complicated method of arriving at an exact calculation of the distribution of the two components between the respective phases, and procurable only by repeated corrections. However, the calculation is extremely simple if made on the basis of total quantities concerned. All that is necessary is a knowledge of the quantity of each substance necessary to provide a "saturated solution" in the other. This is an obviously simple determination. The algebraic formulas are as follows:

Allow: "A" to represent the total weight of the first component,

"B" to represent the total weight of the other.

P_1 = the weight of the first phase.

P_2 = the weight of the second phase.

a = the weight fraction of the first component of the first phase at the specified temperature T.

a′ = the weight fraction of the same component of the second phase at the same temperature.

Therefore, by material balance:

$$aP_1 + a'P_2 = \text{"A"}$$

$$(1-a)P_1 + (1-a')P_2 = \text{"B"}$$

If, for example, "A" = 500 lbs., "B" = 250 lbs. a = 0.20, and a′ = 0.90, substituting in the above equations would give the following solutions:

P_2 = 500 lbs., P_1 = 250 lbs. P_2 will consist of 450 lbs. of the first component and 50 lbs. of the second. P_1 will consist of 50 lbs. of the first and 200 lbs. of the second.

If the system is augmented by the addition of a quantity of either of the two substances, the simplest way to determine the nature of the change is to repeat the above calculation using the new totals for "A" and "B," and merely compare results.

For most two-component systems the above discussion applies over a considerable range of temperature. The saturation figures will, however, vary with temperature; and, in general, as the temperature increases, more and more of each constituent becomes soluble in the other until the two quantities coincide at what is sometimes called the "critical solution temperature." The point of coincidence for one pair of compounds will, in general, have no relationship—either as to ratios or temperature—to the analogous point for another pair of compounds. Above the "critical solution temperature," the two constituents are miscible in all proportions, and only a single phase can exist regardless of the relative percentages.

Figure 1, the phase diagram for two hypothetical liquids "A" and "B," illustrates in a concise manner the typical behavior of binary systems as just discussed. The two points marked re-

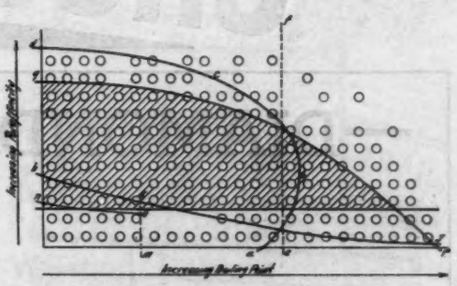


FIG. 2

spectively a and a′ show how, at the temperature in question, the two phases will respectively contain 90 per cent and 20 per cent of "A." Abscissa X stipulates that "A" and "B" are present in the ratio of 500 lbs. to 250 lbs. (66⅔ and 33⅓ per cent).

We have now seen how any two "pure" fluids which are not completely miscible each with the other can form two different types of solutions; and how, over a certain range of relative proportions and range of temperatures, the contacting of these two materials will result in the formation of two distinct fluid phases each of which will comprise a portion of each constituent.

Distillation of Binary Systems

The effects within these ranges, both of which are described graphically in Figure 1, are in general but little influenced by pressure—except when, by virtue of the existing temperature, the vapor pressure of the solutions tends to exceed the imposed pressure. In such a case evaporation will,

of course, occur; the unvaporized portion will continue to obey the phase diagram even if heating is continued, while the vapor will obey the "laws" of vaporized binary solutions—a matter somewhat beyond the scope of these discussions and which, therefore, will not be considered in complete detail, although there is one angle of vaporization which is within the scope of our present interests: If two phases do co-exist at equilibrium and the imposed pressure is so established as to permit boiling to occur as soon as additional heat is supplied, either phase can boil—and even if the two phases should be removed to separate stills, the initial boiling point will be the same for both; and the first increment of distillate issuing from one will be identical with the first increment issuing from the other. A general statement of this fact is that the vapor pressure of any specific constituent is the same in all phases which co-exist at equilibrium. As a result of this, if two phases co-exist in a single still (for example, under conditions specified by point d in the phase diagram) boiling will take place at constant temperature Tb, and with unvariable distillate composition, until either points b or c are arrived at through the effect of preferential removal of one of the distillate materials. To be sure, if the composition of the distillate is identical with the abscissa D, or if as distillation continues an abscissa is attained which corresponds to the distillate composition, then evaporation will continue to dryness without ever attaining either of the points b or c. It is clearly evident that when still composition and distillate composition are identical, no desirable function is performed by distilling equipment; and it is a good rule of thumb to state that, in distillation operations, two co-existing phases should be decanted as soon as possible.

An effect which is more or less a corollary of the above is that when "A" is the more volatile of the two constituents and boiling starts at b with only a single phase present, essentially the same phenomenon will be observed: i.e., boiling will take place at constant temperature and constant distillate composition, either until point c is attained or the charge has been distilled to dryness. This means that while one phase alone may be charged to a still, a batch distillation will actually take place with two phases present. When the mechanism of the occurrence is studied, the reason for this fact is easily evident: "A" being the more volatile, the distillate will be richer in it than was the liquid from which it was removed; this is, in effect, to increase the relative ratio of "B" to "A" in the undistilled portion or to move the operation along line b-d-c to the right. Along this line we have already seen that the outward characteristics of vaporization are constant. In petroleum work, where a single fluid solvent is used, these various boiling and vapor-pressure characteristics may have little more than academic interest. However, for extraction with two solvents, or where a third fluid like steam is introduced for stripping purposes, these vapor-pressure characteristics may become highly important in the design and operation of solvent-recovery systems—so that a general knowledge of their nature is most desirable. Often when two phases tend to form under distilling or rectifying conditions, two separate stills or columns are necessary for efficient operation; and the feed for one will consist of a second phase which results from the operation of the other. For a more comprehensive consideration of the procedure and theory, the reader is referred to the Principles of Chemical Engineering, by Walker, Lewis and MacAdams, McGraw-Hill Book Co. In some future paper, it is possible that the writer will discuss a specific case of two-phase distillation, involving the formation of a constant-boiling mixture; and show how, instead of proving to be an extremely expensive obstacle, such a happening can be utilized as an aid for simpler and cheaper operation.

Up to the present we have been concerned with the matters pertaining to equilibrium between binary two-phase systems. The principles discussed involve no physical or chemical effects which result in the purification of a substance or substances. In fact, all that has been discussed so far is the vehicle by means of which refining can take place: Solvent refining methods make use of a two-phase system by so controlling the conditions thereon that the two separate phases will behave like two separate receptables. If the system is a suitable one, each phase will possess peculiar powers to hold within itself one class of material, while the other phase will possess an analogous power to collect and hold a different type of material. If originally these two types of material were mixed together, and one was an undesirable adulterant of the other—such as a sludge-forming compound in lubricating oil—it is possible to separate the undesirable from the desirable material by introducing the impure mixture into a two-phase system. This mixture will there be subjected to the preferential action of each phase to gather to itself one or the other of the two types of materials. In extractive refining for the production of superior lubricants, the so-called "solvent phase" tends to retain or extract the undesirable material and to reject the substances which comprise fine lubricating oils. The other phase, commonly referred to as the oil or "raffinate," tends to reject the undesirables while retaining substances of "paraffinic" nature. In actual operation, pains are necessary only to produce the solvent phase—since the oil phase will be automatically formed principally by constituents of the charge itself.

At this point many of my readers will presumably begin to wonder just why it is necessary to build up a rather unusual visualization of the process of extraction. To many it undoubtedly appears more logical to look upon the process as one in which undersirable materials are removed from a raw stock merely by exposing the raw stock to a solvent which will dissolve "undesirables" while desirable components are comparatively insoluble. The answer is this: The problem can neither be explained nor comprehended on the basis of "solubilities" alone! In fact, even the most logical analysis based on such a false premise is almost sure to be misleading, as is exemplified by a certain foreign patent which has been widely read and has deeply influenced "theory," but actually is productive of results entirely opposite to the avowed purpose of the patentees. Solubility is of importance, but of secondary importance only. The prime consideration in the determination of the effectiveness of any solvent process and the method of flow utilized therein is "distribution ratio."

Distribution ratio of a substance is defined as

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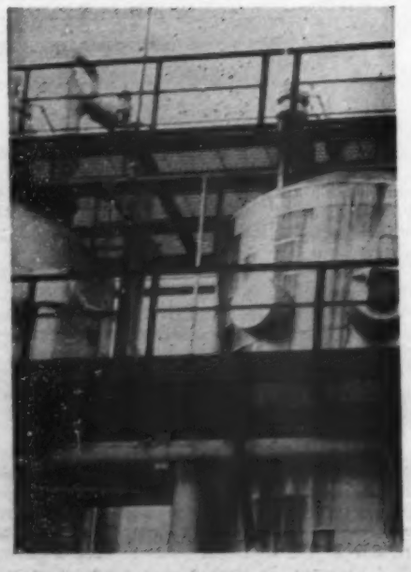

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the concentration of that substance in one phase divided by the concentration of the same substance in another phase. Suppose, for example, that we have a two-phase system composed of crotonaldehyde and a petroleum residuum, in which the solvent forms the bulk of one phase and desirable lubricants the bulk of the other. In addition to crotonaldehyde and good lubricating oil, there will also be present within the system a considerable quantity of hydrocarbon material which is susceptible of oxidation with the resultant formation of sludge. This material will be distributed between the two phases in a ratio established by physicochemical laws: Possibly every 1,000 grams of "solvent phase" will comprise 200 grams of this sludge-forming material; at the same time, the "oil phase" may include 50 grams of the same sludge-forming substance for every 1,000 grams of total substance. The distribution ratio of sludge-forming hydrocarbons, between the solvent phase and the oil phase, is, therefore, 200 divided by 50, which equals 4. The minor importance of solubility is illustrated by the fact that this sludge-forming material will, in all probability, be completely miscible in all proportions with both crotonaldehyde and the superior lubricating oil of which the latter forms the major portion of the oil phase. Generally speaking, the only necessary prerequisites regarding solubility which must be met by a satisfactoy extractive solvent are: that undesirables are highly soluble in it; that "paraffinic" hydrocarbons are very sparingly soluble; and that it, itself, will not dissolve very greatly in liquid "paraffinic" hydrocarbons.

In a manner similar to that used for the sludge-forming hydrocarbons, a distribution ratio may be derived for all other constituents of the system. In the case of the solvent and "paraffinic" oils, however, this ratio will not be completely rigid: Both of these components are sparingly soluble in each other, and a distribution ratio is not a device whereby super-saturated solutions may be formed. Regardless of what the concentration would be when calculated by a predetermined distribution ratio, a saturated solution is the most concentrated which can possibly exist. In consequence, since throughout an extraction operation the solvent phase generally is saturated with paraffinic oil and the oil phase is saturated with solvent, material balances and other calculations involving these components are best handled on the basis of absolute solubility; furthermore, from one stage to another, the variation of either saturation figure is small and of comparatively little concern. In the end of the system from which the spent solvent is expelled, the concentration of paraffinic constituents is, to be sure, highly important from the viewpoint of yield. However, that is a rather long and complicated question, and capable in itself of supplying ample material for a separate paper. Furthermore, it is a question more of an operative refinement than of basic principles per se.

As one travels from one end to the other of a countercurrent extraction system, the distribution ratio of undesirable constituents between phases will not remain entirely constant. Of course, if only three pure components were present, the distribution ratio for one of them which chanced to be completely miscible with the other two would, over a considerable range of conditions, remain but little changed. For example, if into a two-phase system we should introduce 500 grams of a pure substance, miscible with both phases, and the distribution was found to be 400 grams and 100 grams, respectively, it would be reasonable to expect that 1,000 grams would divide in about the same ratio or, roughly, 800 grams to 200 grams.

In making the above statement, it is pre-supposed that we are discussing moderately dilute solutions containing three pure components. With the commercial solutions encountered in solvent refining, the undesirable hydrocarbon substances are far from pure; in fact, they comprise a multitude of individual compounds, each of which has its own individual distribution ratio. Any ratio which is calculated on the basis of the entire extract is, therefore, a composite figure—a species of average distribution ratio. Since those components of the extract which have a high ratio between the solvent and oil phases will be the more readily removed and quickly travel toward the solvent exit, the "distribution ratio of the extract" will steadily decrease as the oil phase passes on from stage to stage. It is impossible, therefore, to simplify

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the problem by calculation of a multistage extraction on the basis of a constant distribution ratio. Only over short portions of the line of flow can any specific ratio be used with reasonably quantitative accuracy; but, for purposes of visualization, it is necessary—and, I might almost say, it is sufficient—to bestow upon "distribution ratio" qualitative significance. It is only in the light of such visualization that the great value of countercurrent flow is made evident. It is through intelligent application of this principle that most manipulative improvements have come about, whereas failure to recognize its import has cost great sums in wasted efforts. It is, in short, the basic principle of solvent extraction.

In the preliminary discussion of the two hypothetical components "A" and "B," it was observed that at temperature T two phases will co-exist over 70 per cent of the compositional range. The point has been made that such a two-component two-phase system does not represent a process capable of refining action, but merely a vehicle by which refining can be effected—if any when a raw charge is introduced into the system.

To provide a less abstract illustration, let us say, for the time being, that "A" is phenol and "B" is a highly "paraffinic" lubricating oil—which, for purposes of momentary illustration only, may justly be regarded as a pure substance. From Figure 1 it will be seen that at the temperature of line a-a′, two phases can be made to appear under separate conditions: (1) when enough lubricating oil has been poured into phenol to give a ratio of 10 parts of oil to 90 parts of phenol; or (2) when enough phenol has been poured into oil to provide a ratio of 20 parts of phenol to 80 parts of oil. If the proportions of phenol and oil are so intermediately established that both of these saturated phases will be present in sizable proportions; the system can serve as a suitable mechanism for that variety of solvent refining which has heretofore been briefly discussed. Upon introducing a petroleum substance which comprises an undesirable "naphthenic" material, as well as a large amount of the same fine "paraffinic" oil, "B," the "paraffinic" oil will join this oil phase, but the "naphthenic" portion will become a part of the solvent phase—and a separation of the two constituents of the raw stock thus be effected. The separation is, to be sure, not quantitative, but even in this single-stage operation will be substantial; the principle involved is amply illustrated without discussing the technology necessary to produce commercially quantitative separation. Since it has become customary to observe refining operations objectively, with respect to "impurities" removed, the above operation, in which oil impurities become dissolved in the solvent, is representative of "solvent extraction" of a petroleum substance, and must not be confused with solvent-refining methods which operate on an entirely different principle.

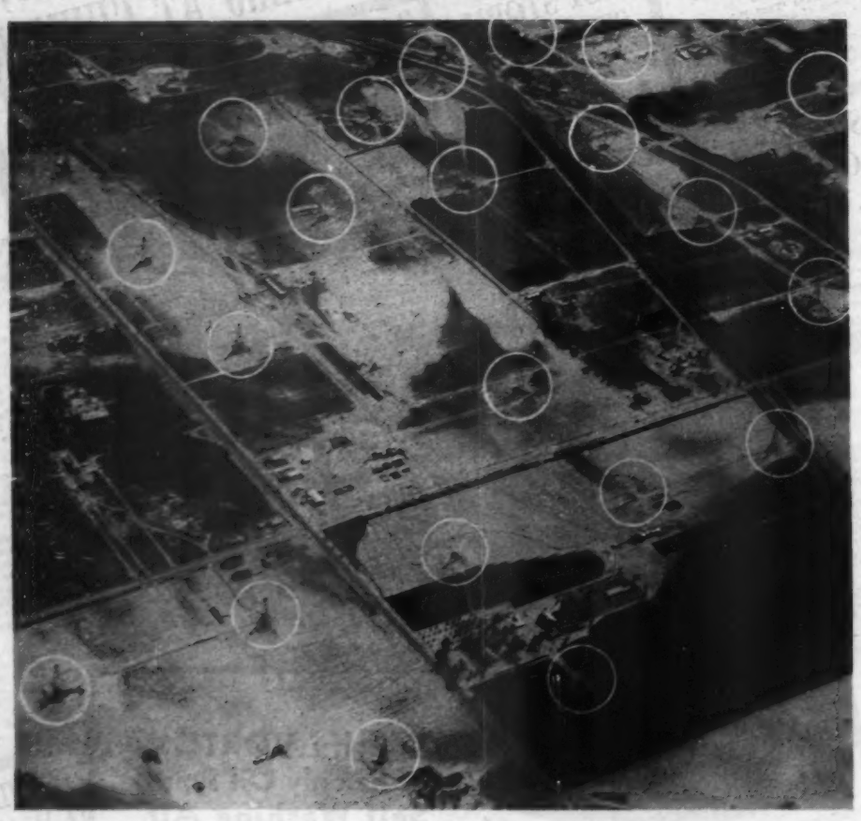
To illustrate this second type of refining, we may also use Figure 1, although we must partially redefine it. We will still retain component "B" and continue to designate it as high-grade "paraffinic" lubricating oil. However, for "A," exemplified by phenol, we shall substitute a solvent "A′" which behaves somewhat differently from phenol. Liquefied propane is representative of this type. All solvents which are highly effective as dewaxing agents also come within the category.

These solvents are used only within that area which is denoted as "single continuous phase," as contrasted to the previous type which is used solely within the "two-phase region." Such solvents as "liquefied" propane are, in fact, generally used at a temperature so high that, regardless of the relative proportions of "A′" and "B," two phases cannot co-exist in a system of pure "A′" and pure "B" alone; in other words, the two basic components are usually miscible in all proportions at the temperature of use. The vehicle for this type of operation is, therefore, a system which is described by some point within the "single continuous phase." Usually this point is one well to the left of the 50-50 point, being much richer in the solvent "A′" than in oil "B."

Having established such a system to serve as a vehicle for refining, it will operate as follows: Introduce an increment of material, positively identical with the other increment of "paraffinic" oil and "naphthenic" impurities which we have just "refined" by means of a phenolic two-phase extractive system. One thing only will happen: The entire increment, "naphthenic" and "paraffinic" constituents alike, will merge with the single continuous phase. There will still be only the one homogeneous body of material, and no worthwhile service will be performed. The point is that "naphthenic," as well as "paraffinic," substances are completely miscible in all proportions with solvent "A′"; and, for removal, require a two-phase extractive system. In the use of the word "naphthenic," I am subscribing to the regrettably inaccurate use of the term to describe such undesirable matter as is removed by an extractive solvent such as phenol, crotonaldehyde, furfural, and the like. Such extracted material is characterized by its unusual affinity for other organic liquids; any solvent highly miscible with "paraffinic" bodies will assuredly be miscible with "naphthenic" substances of equivalent boiling point, and frequently will continue to be highly miscible with the latter—even if means are employed which render the "paraffinic" substances practically nonmiscible.

The above discussion may appear to be an overthorough treatment of a non-existent refining operation, but I do wish strongly to impress the fact that such solvents as propane and dewaxing agents are totally different in their action from normal extractive solvents. To be sure, it may be logically argued that if the temperature is so lowered that the operation takes place in the two-phase region, a class "A′" solvent may serve in an extractive capacity: Qualitatively, this statement is often true, and operation then becomes similar—as proved by experiment—to the extractive procedure previously described. On the other hand, the nature of the phase diagram is usually such that the distribution ratio of the "naphthenic" material is not advantageous, and an extractive operation is, in consequence, commercially nonfeasible.

But even if not suitable to performing all types of separations, the single continuous phase can be effective within the proper field of use—and solvents of the class "A′" type will produce fractionations of a useful nature. If a material is at hand which contains "paraffinic" lubricating oil "B"



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and, in addition, certain heavy asphaltic bodies which are even less miscible with organic liquids as a whole than is "B," we may introduce such material into a proper single-phase system and separate the asphalt from the desirable lubricant. When an increment of such raw stock is added, the bulk of the "paraffinic" material will merge with the single-phase system; the asphaltic matter, however, will be substantially rejected, and will not even be permitted to enter the system. A separation of the raw stock into different classes of material is thus brought about.

The above presentation is not submitted as the one and only basis for description of and differentiation between the two major varieties of solvent refining of petroleum. Nothing more is claimed than that it constitutes the concept which, after 10 years' interest in solvent refining, the writer finds to be the most helpful to him in studying such problems and, in his experience, the most consistent with facts. The writer would not say that he "disagrees" with those who choose to call an "extractive" solvent a "solvent for naphthenic and aromatic hydrocarbons," and solvents such as propane "solvents for paraffinic hydrocarbons." It is merely suggested that, since one of the latter type is, under normal conditions, even a better solvent for "aromatic and naphthenic" hydrocarbons than for "paraffinic" hydrocarbons, such nomenclature may be misleading even to capable technologists who chance not to be highly skilled in this particular art. Personally, the writer—looking at the problem objectively from the viewpoint of "impurities" to be removed from high-grade lubricating oil—prefers the terms "extractive" and "precipitative" solvents, respectively.

While it is admittedly possible to regard precipitative solvents as "solvents for paraffinic" hydrocarbons, the statement must be qualified by adding "under proper conditions." One "proper condition" is that the "paraffinic" substance be present as a potential fluid; i.e., the substance is one which normally melts at a temperature lower than that which exists in the system. In passing through the melting point, a radical change in miscibility takes place—and below this point the tendency of petroleum substances to be miscible with solvents is, in general, greatly reduced—frequently changing from the category of complete miscibility to a saturation value of a fraction of 1 per cent. These so-called "solvents," if added under favorable conditions of solvent-oil ratio and temperature, result in the precipitation of certain substances which form a second phase, which is not necessarily homogeneous in nature. The precipitated substances may be of two distinct types—petroleum waxes and/or asphaltic material. The mechanisms involved are — lacking more comprehensive research on fundamentals—somewhat debatable. Offhand, it would appear logical to suppose that the addition of the solvent brought about a precipitative or "salting-out" effect, whereby the power of the paraffinic components to dissolve asphaltic substances became decreased. Possibly this may be a partial explanation—although the writer, even if unwilling as yet to be dogmatic, is reasonably well convinced that most, if not all, of the consequences are due to the phenomenon first described: In the writer's belief, the "precipitate" from such operations is fundamentally composed of substances which exist at the temperature of operation as potential solids; propane precipitation of asphalt, and naphtha dewaxing, are mechanically similar phenomena. By the addition of a highly-miscible and fluid "solvent" of low specific gravity, the medium through which particles must travel is greatly reduced in viscosity; while at the same time an increased difference in gravity of the phases is brought about. By virtue of this double effect, separations can be accomplished which were theretofore mechanically impossible. When all the facts are "in," the writer believes that this mechanical theory as opposed to a chemical theory will be the answer. At the present time many data exist which tend to confirm the mechanical theory.

To a few able investigators, the fluid nature of certain of the preciptates may appear to contradict the above theory. In the author's opinion these substances are not true fluids, but plastics or "muds" in which the potentially solid material plays the same part as clay does in ordinary mud; while truly fluid hydrocarbons, which are constrained by the solids, act as plasticizers. Some day, when there is much less work to do on extractive solvents, or when the writer has greatly increased facilities at his disposal, he hopes to settle these points definitely.

The Functions of Solvent Processes

Precipitative solvents tend to remove from a raw stock the substances which melt at comparatively high temperature, a statement which amounts to saying that they tend to remove substances of high molecular weight or of moderate molecular weight and extremely great paraffinicity. In case there are those among my readers who are unconvinced as to the "mechanical" theory of precipitative solvents, the last statement is provided with further substantiation—which, although not used in substantiation of the "solids" argument, might well have been. By and large, distillation is a method by which comparatively heavy molecular substances may be separated from lighter molecular substances by throwing the latter overhead as distillate. If carried sufficiently far—using steam, high vacuum, or both—such distillations are roughly equivalent to "propane precipitation" of asphalt. Figure 2 is a graphical representation of how a petroleum fraction—for example, a residual stock—may be purified to produce a premium lubricating oil.

In this illustrative diagram, which is completely hypothetical, minor inconsistencies are permitted for simplification. Each small circle is representative of one volume, say one quart of residual stock. The location of each circle specifies the characteristics of that quart of oil. Those at the bottom are the least paraffinic; those at the top the most paraffinic; in fact, these are true paraffins, solid at normal atmospheric temperature. A circle at the extreme left of the diagram would boil at the lowest point of all; a circle at the extreme right would boil the highest. When all of these quarts of different types of hydrocarbon are mixed together, they constitute a hypothetical residual lubricating stock, produced by removing the naphtha and gas-oil fractions. If this constitutionality-com-

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plicated substance is subjected to conventional propane precipitation, a separation along line a-b-c-d will be brought about. Material to the right of this line will contain the high-melting and high-boiling asphalts—and the stock has now become "deasphalted." Deasphalting can also be brought about by continued distillation—say, to line e-f: such a separation not, of course, being entirely identical with, but broadly approximating the results of the precipitative step.

For production of a premium lubricant there still remain two other types of substances to be separated from the remaining portion of the stock. Only such substances as lie within an area such as that which is cross-hatched in Figure 2 conform in all respects to requirements of high viscosity index, low carbon residue, and unusual stability. Such undesirable materials as have not been removed by the deasphalting procedure and lie below the cross-hatched line may be substantially removed by a true extractive operation such as is possible by solvents like crotonaldehyde, nitrobenzene, "chlorex," or various phenolic substances. To be sure, such extraction may not be made to coincide exactly with the lower boundary of the "good-oil" area: Lower boiling substances are inherently more soluble than are those boiling at higher temperatures, and a treatment which will be ideal for materials of average boiling point will slightly overtreat the low boiling end and somewhat undertreat the high boiling end. The relationship between the lower boundary line and line h-j, which is the "extraction" line, will illustrate this point. The extracted material is that which lies below line h-j and is characterized by poor viscosity index, high carbon residue, lack of stability, high pigmentation, and generally represents a material which is undesirable for the average lubricant. The only materials which comprise it and possess much real value to lubricants are certain "polar" substances which do tend to cause an oil to stick better to bearings and thereby assist in maintaining a coating or film of lubricating oil.

In the lighter fraction of this extract there may exist a fair amount of material which could desirably be included in the final high-grade product. If it is considered worth the effort, a considerable percentage of such materials can be salvaged: If the extract is subjected to distillation, a high percentage of such material may be recovered—in a very impure state, to be sure—by collecting a distillate of, say, one-third of the extract. Such a distillation can be portrayed by a line k-m. The distillate will be the portion to the left of this line—which area, it will be seen, includes the bulk of the cross-hatched area included in the extract. This distillate may be accumulated and again extracted with a solvent of different solvent power from that previously used, for example along line n-o. The material above this line can be added back to the original raffinate.

The material above the cross-hatched area is undesirable from a single viewpoint only: Being substantially pure paraffins, it is composed of substances which are solid at normal atmospheric conditions and will tend to cause the oil to congeal and, by inability to flow, to fail of proper lubrication. By modern dewaxing methods, it can be removed so efficiently that the line of demarcation of the two fractions will substantially coincide with the prolonged upper boundary q-p of the cross-hatched area. It will be noted that the steps which have been utilized in the refinement of the hypothetical residual stock overlap, to a small degree; in consequence of which the several by-products will be influenced somewhat by the order of these steps. An oil dewaxed before deasphalting will produce a "petrolatum," which may contain very considerable percentages of asphalt; and an oil which is extracted prior to deasphalting will produce an extract containing appreciably more and harder asphalt. Since these extracts may invariably be reduced by distillation to produce asphaltic pitches of most excellent ductility, a refiner interested in producing asphalt of high ductility may find that extraction desirably comes first.

With reference to the matter of overlapping, there actually will exist "overlapping" of a type which cannot conveniently be shown by a diagram such as Figure 2. In actual operation, lines of separation may not be defined as clearly as indicated in the diagram. As here presented, one would conclude that the finished lubricant would contain all of certain substances, for example, a quart of oil centrally located in the cross-hatched area. Actually, none of the substances can be 100 per cent diverted to any one fraction; but presumably all fractions (wax, asphalt extract, and finished lubricant) will contain at least minute portions from every circle shown. In the case of the lubricant, a few substances such as asphalt components may be present in minuscule proportions—especially if the lubricant has received a final processing, of a physicochemical nature, capable of removing certain bodies practically quantitatively. The extract, however, will contain a little of everything which ever did exist in the raw residuum; in fact, the question of keeping the "paraffinic" content of extracts at a minimum is the most important operative problem of solvent extraction.

Summary

The present exposition has covered only the bare foundations on which the technology of solvent extraction must be built. It should be kept in mind that there is a basic difference between fundamental principles and technological developments. The contents of this paper do not provide the information necessary to reproduce a process by means of which a specific stock may be refined. As a matter of fact, the variations in raw material are almost without end, and technology must be made to conform to each individual requirement. A truly comprehensive treatment, descriptive of actual processing details necessary to secure the best results on all types of stock, would be encyclopedic in size as well as purpose. As a broad objective, the writer has tried merely to describe clearly those factors with which technology must be in accord, and to depict those mechanisms which can be made to serve as tools but which may not be changed by the will of men. Specifically, the writer has hoped to establish clearly an appreciation of the difference between the basic principles and the utilities of "extractive" and "precipitative" solvents.

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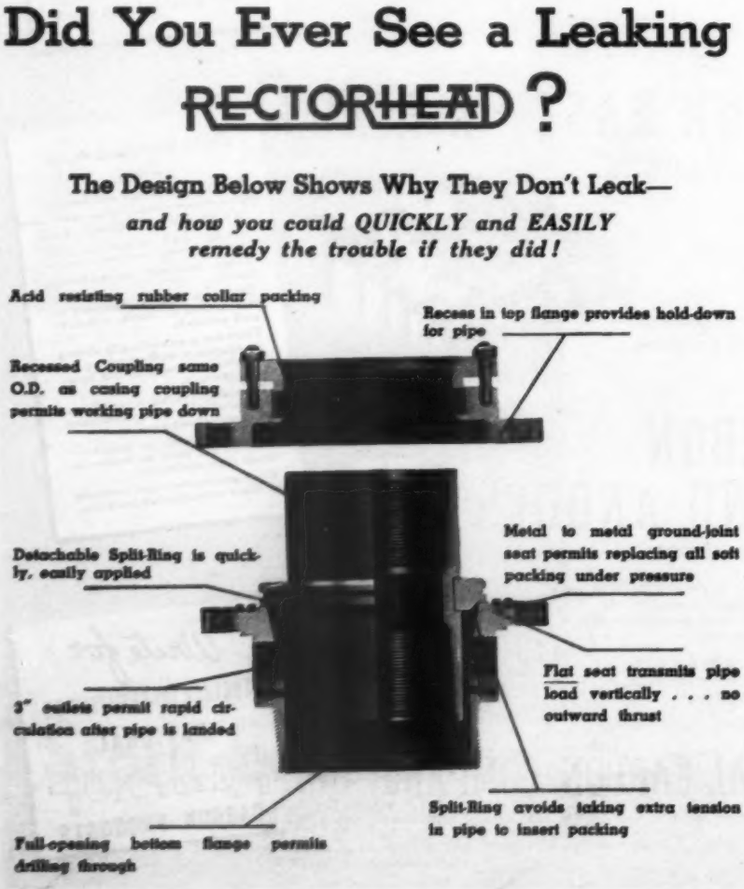
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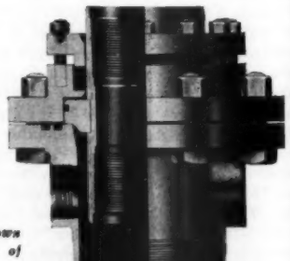

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Color Restoration of Gasoline and Kerosine in the Field

By J. B. RATHER and L. C. BEARD, JR.
Socony-Vacuum Oil Co. Inc., New York

The discoloration of gasoline and kerosine initially refined to a water-white color, when held for some time in storage, has for many years been an annoying and, in many instances, a costly problem to the petroleum industry. The problem has, perhaps, been more acute in the case of export gasoline and kerosine than in domestic markets. This, of course, is largely due to the longer storage periods entailed in export distribution and also to the difficulties involved in shipping discolored products back to the refineries for reconditioning. In domestic markets gasoline, several years ago, gave rise to the greatest amount of trouble but the introduction of colored gasolines has, to some extent, ameliorated this situation. With kerosine, however, the trade is becoming more critical in demanding a colorless product. In a measure, this is due to the introduction of range burners equipped with glass containers holding several gallons of kerosine, which make any discoloration more evident to the purchaser.

To give some idea of the magnitude of the losses which might be sustained when kerosine goes off color in bulk storage, the following example is of interest. In India there were generally marketed two grades of burning oil—one of which was white in color, and had satisfactory burning characteristics; the other was yellow in color, and a relatively low-grade product of poor burning characteristics. The price differential between these two grades was approximately one rupee (37 cents) per 10 gallons. Whenever any oil initially white and of good burning characteristics went off color, it was assumed by the trade that it was the inferior burning product, and a reduction in price of approximately one rupee per 10-gallon unit was insisted upon. In the case of an 80,000-bbl. tanker this would entail a loss in the neighborhood of $140,000 if it became necessary to dispose of the discolored oil at this price reduction.

***A.P.I.*—Presented Mid-Year meeting of American Petroleum Institute, Tulsa, May 14, 1936.**

We have been investigating this problem for more than 10 years. It was early found that the discoloration of kerosine and gasoline during storage was due to oxidation, and that samples of kerosine stored in an inert atmosphere in the absence of oxygen maintained their initially colorless condition for a long period of time whereas those stored in air went off color much more quickly. Our initial efforts were directed towards the development of oxidation inhibitors which would act as color stabilizers. A number of compounds were found which, added to kerosine and gasoline in concentrations as low as 1 pound to 15,000 gallons, effectively stabilized the color. Among these compounds were the following: thiocarbanilid,[1] hydroquinone,[2] resorcinol,[3] pyrocatechin,[3] pyrogallol,[3] phloroglucinol,[3] 1,2,4-trihydroxybenzene,[3] butyl pyrogallol,[4] alkyl substituted dihydroxybenzene,[5] alkyl substituted polyhydroxybenzene,[6] ethanolamines,[7] urea,[8] and thiourea.[8] Many of these compounds are also effective inhibitors of the formation of gum in gasoline— which, of course, is also an oxidation phenomenon. Some idea of the effectiveness of these inhibitors in preserving the color of refined kerosine can be gained from the following tabulation, which is based on the examination of more than 100 cases of oil, half of which were stabilized with pyrogallol in a proportion of 1 pound to 10,000 gallons, and half of which were unstabilized. These cases were shipped abroad and stored in tropical warehouses for six months, and then shipped back to this country for examination. The initial color of the oil was somewhere between 18 and 21.

Number of cases examined	111
Age of samples when examined	10 to 14 months
Stabilizer (pyrogallol)	1 lb. to 10,000 gal.

Per cent of cans which were:

	Stabilized (per cent)	Unstabilized (per cent)
+12 and higher	81.62	14.30
0 to +12	17.44	44.20
—1 and lower	0.94	41.50

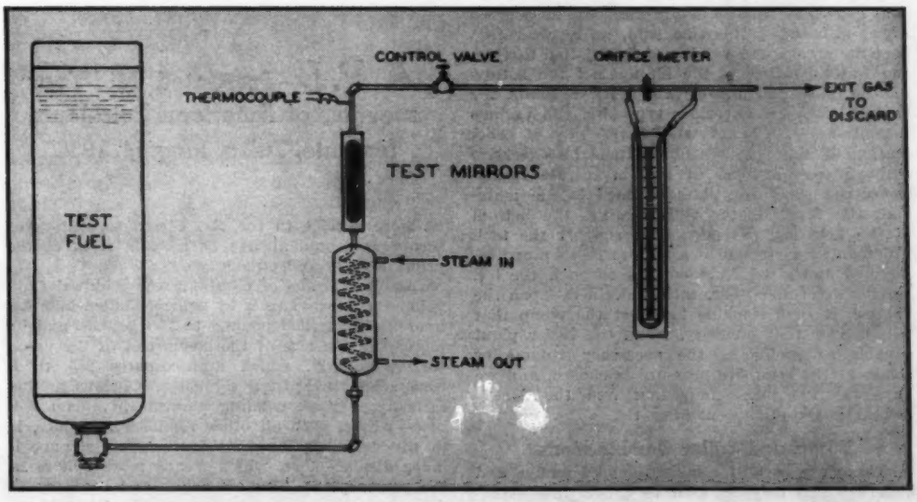
In the course of our investigations leading to the development of these color stabilizers, it was found that certain of these compounds, in particular the polyhydroxybenzenes such as hydroquinone, pyrogallol, and diamyl hydroquinone, possessed the property of decolorizing kerosine and gasoline which had gone off color in storage. In many cases, the color was restored to very nearly the initial color of the oil when freshly refined, and the restored color was retained by the oil without subsequent discoloration for periods as long as six months. The preferred procedure of effecting this decolorization is to dissolve 1 pound of, for example, hydroquinone in 1 gallon of a suitable solvent, such as isopropyl or ethyl alcohol, and treat the oil under good agitation with this solution in the proportion of 1 gallon of solution to from 2,000 gallons to 15,000 gallons of oil, depending upon the degree of discoloration and the age of the oil. After decolorization has been effected, it is preferred to store the oil in the absence of water; since oil decolorized with this reagent will revert to its colored condition if intimately mixed with water to such an extent that the decolorizing agent is removed because of its greater solubility in water. It is believed that, since vigorous shaking with water will cause the color to return to the oil, the mechanism of the decolorization phenomenon is due to the formation of some loose addition compound.

In some cases it may be found that decolorization with these materials does not raise the oil to a marketable color. In these instances, if the oil has been raised to a color of +14 or higher, additional treatment can be made with an oil-soluble neutralizing material which in concentrated solutions gives a blue to a violet color. In the concentrations in which these materials are used practically, however, the amount of blue-violet neutralizing added is just sufficient to counteract any residual color not removed by the first treatment. These oil-soluble blue-violet neutralizing materials can also, of course, be used on oil directly without preliminary treatment, provided the color of such oil is not lower than +14. The cost for decolorization of oil by treatment with hydroquinone and the blue-violet neutralizing material will be somewhere in the neghborhood of 1 cent per barrel. This process has been used commercially for a period of eight years, with very material savings. In 1928 it was first utilized in India, Indo-China, Straits Settlements, and the Netherlands East Indies, under the most adverse climatic conditions with entire success; and from that time until this has been used successfully both here and abroad, with savings that mount into seven figures.

One point of interest, in this connection, is that in the case of any one oil produced from any one crude, and by the same method of refining, only a certain proportion of this oil will go off color—depending largely upon the conditions of storage and catalytic contaminants which might be present. It is obviously uneconomical to refine all oil to the extent necessary to insure that no small part of it under unusual and severe conditions of storage will go off color. Considerable savings in refining expense can, therefore, be realized by refining only to such an extent as is necessary to afford reasonable color stability, and then decolorize in the field such oil as may go off color.

[1]U. S. Patent No. 1,916,433.
[2]U. S. Patent No. 1,951,205 and 1,951,208.
[3]U. S. Patent No. 1,951,206 and 1,951,207.
[4]U. S. Patent No. 1,959,315.
[5]U. S. Patent No. 1,959,316.
[6]U. S. Patent No. 1,959,317.
[7]U. S. Patent No. 1,989,528.
[8]U. S. Patent No. 2,002,645.

APPARATUS FOR DETERMINING CORROSION OF BUTANE



Corrosion testing apparatus for liquid butane developed by M. M. Holm, Standard Oil Co. of California, described before the Kansas City meeting of the American Chemical Society

Rotary-Drilling Practices

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This paper is limited to a brief discussion to those salient points which are most pertinent to and of most importance in the drilling of a well by the rotary system, these being the bit or cutting tool, the weight to be carried on the bit, rotating speeds, and mud-laden fluids—with particular reference to the Kettleman Hills field of California, where probably as great a variety of drilling conditions is encountered as in any other one field. The order given is not the order of importance; because these factors, with one exception, play equal parts in the drilling of a well, and without properly-balanced values between them an efficient operation cannot be had, and the resulting over-all rate of drilling cannot attain its maximum efficiency. It will be assumed that the equipment in use on a given operation is the best available for the particular job to be undertaken. Necessarily, subsidiary subjects must be brought into the discussion, in order that the methods of and means for arriving at the various values of the several factors may be in more or less progressive order and readily understood.

Boilers and Pumps

The most important factor used in the drilling of a well is the mud-laden fluid circulated through the bit, both as to its volume and character. Volume is dependent upon the mechanical equipment of the rig, while physical character should be controlled by the requirements of the formations being drilled.

In order to promote circulation of the fluid through the hole, the rig must contain in its mechanical equipment boilers, pumps, and power for driving the drilling tools. Only steam-power plants will be considered here. Regardless of the job to be done, the depth and size of the hole, the nature of the formations to be drilled, or the equipment to be used, the most important consideration of all is the source of power for the prime movers of the rig, the boiler plant, its horsepower capacity and steam pressure. Without a plant that will deliver steam of the proper pressure in adequate volume, no drilling operation can reach its maximum efficiency. This steam pressure and volume is, or should be, controlled entirely by the volume of mud-laden fluid to be delivered to the bit for maximum drilling efficiency and the type pumping equipment employed. The first problem, then, is to determine this fluid volume. This is most readily ascertained by actual experience in the drilling of wells in a given area; although it may be said, as a generality, that the greater the volume of fluid jetted through the water courses of the bit against the bottom of the hole (within certain critical limits for various sized holes, certain type bits, and various formations) the faster will be the rate of penetration of the bit. If fluid volume be excessive through certain types of bits in certain formations, i.e., some rock bits in hard brittle material, the force of the fluid against the bottom of the hole has a tendency to support the tool. This can be corrected to some extent by properly-directed and sized fluid courses through the bit. Having determined—or, rather, decided—upon the volume, it then remains to select the pump that will deliver that quantity. Next, the boiler plant capable of producing the necessary volume of steam at the requisite pressure is chosen, and we have the two most important and the fundamental parts of the drilling rig.

Pump and Boiler Combinations

There are several combinations of pumps and boilers which may be used to obtain this necessary fluid volume. The most obvious, and that in most general use, is a pump of the usual type which has the proper capacity at normal speed, and a boiler plant that will deliver steam at that pressure and volume adequate to run the pump at that speed which will displace the desired quantity of mud against the maximum contemplated drilling pressures. In the usual pump the steam-piston diameter is approximately double that of the mud-end piston for the largest size liner, i.e., the steam piston has four times the area of the fluid piston, the pump being capable of putting up a fluid pressure somewhat less than four times the available steam pressure. In areas where the more difficult drilling problems are encountered, a pump of this character necessitates the use of what are considered to be, in oil-field practice, high-pressure boilers—300 pounds to 350 pounds. There are admittedly some disadvantages to high steam pressure around a drilling rig; but when the necessary fluid volume can only be delivered by the use of these high pressures, then they are absolutely essential for efficient operation; and in the end, with the proper operating methods, the actual cost of such a plant (excepting its first cost) is no greater than for lower-pressure units. The dangers are the same—a boiler that delivers steam at 100 pounds pressure will, if it should explode, kill a man as quickly as one of 350 pounds working pressure. So, briefly, it would seem that there are no logical reasons against the use of high-pressure boilers as such, and, when they are necessary for the work to be done, they should be used.

A question of great importance is that of the use of the superheater in an oil-field boiler plant. The advantages of superheated steam over saturated steam, especially at lower oil-field pressures, are quite evident; but the relative advantages of a superheater as against an additional boiler seem to be dependent entirely upon the existing conditions. Without discussing the various reasons involved, it seems apparent that, when the steam-power plant is capable of supplying steam to direct-acting steam pumps in adequate volume but in insufficient pressure, a superheater will be quite helpful, and may displace a boiler—provided volume will still be sufficient. Additional boilers would, of course, be useless, When a rig boiler plant of from two to four boilers is capable of supplying steam at adequate pressure but in insufficient volume, then an additional boiler is of more service to the rig. Steam separators or scrubbers should always be used in front of the prime movers and pumps.

Another means of obtaining the required fluid volume and pressure is by using boilers which deliver steam at 200 pounds to 250 pounds and by increasing the size of the steam end of the pump correspondingly, which approximates 2½ to 3 times the fluid-piston diameter. Obviously, this calls for a corresponding increase in steam volume—which, with all other facilities adequate, is in direct proportion to the increased steam-cylinder displacement, which means more boilers in the power plant. The efficiency and economy of this type pump is yet to be proved, although apparently the few at present in service are showing satisfactory results; i.e., they are delivering the desired volume of mud-laden fluid with reasonable economy.

A third method of attack is to operate a power pump with an efficient multi-cylinder steam engine having a variable cut-off, permitting the full use of the expansion of the steam. Running at maximum efficiency, this combination of units should show a steam-volume saving somewhat in excess of 40 per cent over the direct-acting steam pump. Thus it is possible immediately to eliminate roughly one-third of the boiler-plant capacity. Power pumps of adequate power end capacity are now available for the most difficult problems as encountered in Kettleman Hills, Ventura, and similar areas. Where fuel economy is important and good water scarce, the value of the combination is unquestionable. For the operation of these power pumps, there is much prime-mover equipment available that will permit the use of low-pressure boiler plants of relatively small-volume capacity and still deliver all the fluid that might be required. Maximum efficiency demands the use of superheated steam in a pumping plant of this type.

Engines and Drawworks

The engines now in use may be dismissed as being adequate, although some are not so efficient as they might be. Although the drawworks or hoists are entirely unsatisfactory in many respects, the recent developments tending toward improved and continuously-sprayed or oil-bath chains and sprockets seem to have materially increased their utility and economy. More time is necessary for complete tests of the value of the improvements.

At best even, these new hoists are makeshift, and extremely crude and inefficient; but there still remains the possibility of building an efficient and safe machine capable of handling the most difficult drilling jobs—which means, in other words, capable of handling long strings of drill pipe at the highest safe speeds. It is possible that the present-day fundamental methods and equipment are not the best that can be applied to the work.

Bits

Bits may be classified by types as "drag" or those designed actually to cut or sheat the formation; disc bits, which work on a similar principle to the drag-type, but are otherwise quite different; the Zublin-type; and rolling-cutter rock bits.

Drag bits are of many patterns, shapes, and forms—which, in general, may be reduced to three types: viz., two-way or fishtail, three-way, and four-way bits. The last two may have leading pilots or may cut a high center hole. Each of these various types has its advocates, and is best suited for use in certain formations. In general, they have been developed through trial and error, rather than along logical lines of engineering or scientific research. Possibly the trial-and-error method of development has been, and is, more satisfactory—although it seems certain that systematic research would be helpful.

The simplest of the drag-type bits is the two-way or fishtail, and was the first boring tool used in the industry. They vary from the long-bladed heavy patterns, with the water courses one to several feet from the cutting edge of the bit or the bottom of the hole, to the bell-bodied fishtails or, as commonly called, "gumbo" bits. The dressed part of the blade, which contains the cutting or shearing edge at the bottom, varies from practically flat to deeply-concave on the forward side; and the outer point may be advanced from the true radius of the hole or be coincident with it. It may be said here that the old

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(The statements and opinions expressed herein are those of the author, and should not be construed as an official action or opinion of the Institute.)

A.P.I.—Presented Mid-Year meeting of American Petroleum Institute, Tulsa, May 14, 1936.

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BETTER BE SAFE THAN SORRY

long-bodied fishtail or "paddle" has been, or should be, discarded except for special jobs—although the bell-bodied tool still has a wide field of usefulness in drilling those formations which tend to ball up on the bit and have to be removed from the hole as mud rather than as cuttings. These are the "gumbos" or plastic clays and sticky shales. For formations of this nature, the gumbo bit with very slightly concave blades is an excellent tool, and probably the best type that can be employed. The slight concave forward surface of the blade is desirable in order that the cutting edge may do somewhat more than scrape the bottom of the hole; but should it be too severely concave, the tool will dig in too rapidly and be difficult to keep clean. The water courses should be so directed across the blade that the mud stream will be as effective as possible in keeping the tool clean. The use of the fishtail or two-way bit in any but these soft sticky formations should be avoided, as it will not run smoothly in hard beds because of having one line of bearing surface on the bottom of the hole. This bit is best built with a tool-joint box rather than a pin at the top.

Three-way drag bits, although not in very general use, are probably the most logical of the several types in so far as the number of blades are concerned—it being a well-known fact that a three-point boring tool of any kind will run more smoothly than will a two- or four-way tool. The three blades of this bit may be made as three full blades or as the "fingering" type. The three blades or outer fingers are all built to gauge size and cut the same hole area, with the inner fingers so spaced that a cutting edge on one blade follows a blank of the next blade. These bits should be built with a tool-joint box up, and have one circulation outlet over each blade; and the blades should extend not more than a few inches below the body of the tool.

Four-way bits are usually built with the blades at 90 degrees—although some manufacturers prefer to build them in an "X" form. The bell-bodied type with the tool-joint box up is likewise the best form for this tool, and the four blades should be cut into fingers slightly concave on the forward surface and slightly leading at the outer points. Only one of the cross members should be built to gauge; the other should be about one-eighth inch less in width in order to avoid binding. There should likewise be holes so placed that a fluid stream is directed against each blade, and the cutting edges should not reach more than 4 inches or 5 inches below the body of the tool. Long pilot cutters on the bit should be avoided; they tend to drill a crooked hole.

It is general practice at the present time to use cast-steel bits; they are proving to be very satisfactory, and breakage is practically nil—although they are subject to fatigue, and should be normalized after each third or fourth runs. The blades of the bit, of course, are dressed with tungsten-carbide inserts in such a manner that the edge will become serrated. The water courses of the tool should be very carefully directed to clean the cutting blades and not dig into the walls of the hole. Most bit manufacturers and welders are extremely careless in this respect; and seem to think that, as long as the fluid is allowed to get out of the bit and wash some of the cuttings upward, it is doing that which is required of it. But this is obviously not all that is necessary; a properly-designed and dressed bit, improperly cleaned, is not an efficient cutting tool.

On a fishtail bit the bearing surface of the bit (the cutting edges in contact with the bottom of the hole) is 100 per cent of the diameter of the hole. On a three-way or four-way tool, the bearing surface should not exceed the actual bore diameter plus 10 per cent, which 10 per cent should be placed on the gauge side of the bit to cut the outer area of the hole. The design and building of these bits for a given field should be very carefully studied, as practically all formations have their peculiarities and offer definite problems.

Disc bits, which work on the principle of the ordinary disc plow, are excellent hole makers in formations to which they are adapted, and provided they are thoroughly cleaned and properly run. They require for best efficiency an extremely delicate and uniform feed, with relatively little weight and a large volume of circulating fluid. Having replaceable cutting elements, which are dressed and finished by the manufacturer of the bits and not in local welding shops, a more uniform product is generally obtained. This tool is best suited for use in materials such as shales and sandy shales which are neither very hard nor sticky. The common criticism of them is that they are hard on drill pipe. This does not seem to be true in formations in which the bit may be logically used and when they are properly handled. As hole makers, under favorable circumstances, they are probably the best of the shearing-type bits—although in formations of varying character, where there are hard beds and sticky streaks, they may not be so useful as the ordinary drag-type.

Rock bits of the rolling-cutter type were first built to drill the limestone cap rock of some of the salt domes along the Gulf Coast. Since that time vast improvement has been made in the steels used and in the methods and manner of finishing the cutting teeth. Roller bearings, lubricated by the mud-laden circulating fluid, have taken the place of the old sleeve bearings and of the rather ineffective oil lubrication. Through the use of superior steels, the cutters have been lengthened; and, with a layer of the hard, highly-abrasive tungsten carbide on one side, they are in a manner self-sharpening and can, therefore, be kept in the hole for a much greater length of time than could the older, replaceable cutter-types without hard-facing alloys or roller bearings. Another practice that has enabled the tools to make faster hole is the increase in rotating speeds over the 30 or 40 r.p.m. that was customary for the earlier types.

The design and form of the actual cutting elements and their teeth show only very slight improvement. The manufacturers of these tools have striven to their utmost to improve them, and have succeeded, except in the design of the cutters. Now it remains to pattern the form of these elements to increase their actual cutting ability in so far as the principle of cutting is concerned.

The cutting elements are of two general forms: one cylindrical, and the other cone-shaped. On these there are two general types of teeth: one positioned along the radius from the center of the cutting tool, and the other around the cylindrical or cone-shaped part at angles approximating 90 degrees to the radius. The first of these types leaves radial striations on the bottom of the hole. All of these teeth, or practically all of them, are regular and symmetrical in form; i.e., the axis of the tooth is normal to the tangent of the circle at the base of the tooth. As the bit rotates, these teeth strike the botom of the hole in a direction normal to its surface. This, in fact, gives a blow similar to that imparted to the stone when a mason holds his chisel vertically and strikes it on the head with a hammer or maul. This does not chip the stone from the solid, but rather drives the chisel—or tooth, in the case of a rock bit—into it and shatters or breaks out particles of the stone on either side of the cutting tool by a wedging action. The mason uses this type cutting tool for certain purposes only, primarily for decorative effect. When he works his material into shapes and forms and wishes to reduce its face as rapidly as possible, he holds his chisel at an acute angle to the face of the material which he is working. This same principle of stone working is as applicable to the rock-bit tooth as it is to the stone mason's chisel.

Teeth of symmetrical form, radially placed on the cutter, strike the stone a practically vertical blow, displacing particles ahead of the tooth and behind it. Those chips displaced to the front are probably struck and recut by the next descending tooth before they can be removed from the hole by the mud-laden fluid—thus resulting in further comminution of the particles. The other type tooth that is placed at right angles to the axis of the cutters likewise strikes a vertical blow; and, with the hard facing on the outside, has a tendency to displace the particles of stone toward the center of the hole. The mud-laden fluid then comes in contact with the top of the chip and passes it outward toward the periphery of the bore. While in transit, it will again be cut by descending teeth.

It would seem more logical that the teeth be so designed that, as they remove the material being cut from the solid, they throw it toward the outside of the hole—thus preventing unnecessary recutting, and affording the mud-laden fluid the opportunity of passing under the chips and of more rapidly removing them from the working face. The water courses should be so directed that the fluid may play on the bottom of the hole and also rotate the cutting elements in their forward direction, thus preventing locking and sliding on bottom. For pumps throwing a fluid volume of 750 gallons to 800 gallons per minute, the total cross-sectional area of the fluid outlets should be approximately two to three square inches divided between four or five holes.

Changing bits: We have not yet learned when bits, either of the drag or rolling-cutter type, should be pulled—it is usually left to the guess of the driller that the bit is dull. In a shallow hole this does not matter greatly unless the bit is run too long, which means slower penetration and danger of deviation from the vertical. In deep holes, in addition, there is the considerable lost time in unnecessary round-trips occasioned by pulling the cutting tool too soon. In proven fields more should be known as to which bit to run in a given section of the hole, and how much footage it should drill (or the rate per foot to which the cutting speed should decrease) before it is changed for a fresh bit. This is the essence of efficient drilling in so far as bits are concerned, and requires systematic study and research.

Weight on the Bit

The bit or cutting tool is attached to the lower end of the drilling shaft which, from the bit upward, is composed of thick-walled heavy tubes called "drill collars" or "bit collars"; thinner-walled pipe, put together with tool joints and couplings, called "drill pipe"; and a hollow shaft of angular cross-section at the top. This composite shaft is by all means the most delicate piece of equipment used in the drilling of a well, and regulates to a very considerable extent the weight that may be carried on the bit. It is essential that the drill pipe above the drill collars be held in tension; otherwise its rotation in unbalanced compression and the universal joint action where it is in the least crooked will cause undue fatigue and eventually fatigue failure. Further, in order that a straight hole be drilled, it is likewise necessary that the drill pipe be held in tension or straight in the hole.

In determining the proper amount of weight to be supported by the bit, four major factors must be considered:

1. The weight that may be carried within the work capacity of the drilling shaft—which is governed by the size of the shaft, the type of bit, the nature of the formation being cut, and the weight of the drill or bit collars at the lower extremity of the string. By work capacity is meant that limit of work which, if exceeded, will cause immediate failures in the equipment or undue strains and consequent fatigue resulting in premature failures. We are not certain that the correct sizes of drill pipe are being used, particularly in large holes; but it may be safely said that they are not far from those dimensions and weights which most fully meet the requirements of ordinary drilling conditions. Positively the steel of the tubes and the pipe-thread forms could be improved, especially the latter. The V-thread, even though slightly rounded, is unquestionably unsatisfactory.

2. The weight that may be carried while maintaining the hole within that degree of deviation from the vertical required of the operation. This is controlled by the type bit being used, the nature and attitude of the formations, the speed of rotation, and the weight of the bit collars. The more nearly horizontal or convex the face is cut by the bit, the more weight that may be applied to the tool and still maintain a straight hole; while, obviously, horizontal formations of any character are less likely to cause deviations from the vertical than are the same formations where they offer inclined surfaces to the cutting tool. The steeper the dip, the greater the tendency for the bit to leave the vertical; also the harder the formations, the greater is this effect of inclination. Alternating hard and soft strata offer the greatest difficulties in straight-hole drilling, regardless of the structural attitude. Probably of most importance and the primary limiting factor in vertical drilling is the weight concentration immediately above the bit. This weight must be sufficient to supply that required by the

bit on bottom and also to hold in tension (or straight) the drilling shaft below the rotary table. Then, to show the extreme example, if the bit is attached to the drill pipe without the use of bit collars, absolutely no weight may be allowed to rest on the bit if a vertical hole is to be drilled. The pumps, through the circulating fluid, must do all of the work. From this minimum, then, the bit-collar weight should be governed by the weight required for the bit and a sufficient surplus to keep the drilling shaft in tension and hanging vertically below the rotary table. Obviously, there is a practical limit to the length of drill collars; for, if they are too long, they then assume the position of a drilling shaft without drill collars. Probably 200 feet is as much as can be run advantageously. The ideal collar would be one having its maximum diameter and weight at the bit, and then decreasing in these proportions to the size of the drill pipe. Experience seems to indicate that in ordinary flat-lying formations not more than 75 per cent of the drill-collar weight may be supported by the bit, while 50 per cent is better practice. As the inclination of the beds increases, the drill-collar-weight percentage must be almost correspondingly decreased—until, with strata approaching the vertical, practically no weight may be carried. In hole-straightening work the bit must be especially designed for the job, and the weight carried must not exceed that which will allow a substantial pressure against the reaming edge or points of the bit from the horizontal component of the inclined drilling shaft.

3. A limiting factor of the weight that may be carried is the bit being run; however, this weight limit will so generally fall well within other limitations of the operation that it is really of secondary importance.

4. The weight at which the hole may be most rapidly drilled.

The proper balance of these four considerations results in maximum drilling efficiency, it being assumed that the mud-laden fluid is of that character and volume that is best suited to the formations being drilled and the tools drilling them. This proper balance may not be stated in definite figures because of the many unknowns, the lack of uniformity in the materials being cut, and the wear on the cutting tool; but reasonable limits may be given. Under no circumstances should the weight carried on the bit exceed the weight of the drill collar, regardless of the tools in the string, and 75 per cent or less seems to be better practice. Probably 10 tons of weight is as much as is ever required under any ordinary conditions, and half that weight seems to be generally satisfactory. Naturally, the size of the bit must be taken into consideration.

In some areas where, with the use of guides or reamers, the hole can be kept relatively straight, it is customary to carry substantially more weight on the bit than is logically permissible considering the weight of the drill collars in the string. In consequence, there are many fatigue failures such as break-offs or thread breaks; and as long as these excessive weights are carried, regardless of the absence or presence of a guide, these pipe failures are certain to occur.

A shaft, either solid or hollow, when in unbalanced compression is subject to fatigue upon rotation. In the ordinary drilling shaft, the most of these failures occur in the unengaged threads on the ends of the tubes to which the tool joints are attached. In the machining operation in which these threads are formed, the cutting tool induces a plane or zone of weakness along which the metal is more readily fatigued than in any other part of the pipe and, in consequence, thread failures are more frequent. It is possible that these V-thread failures could be eliminated by the use of a more rounded type.

By drilling a straight hole, generally speaking, the drilling shaft is, in consequence, subjected to minimum labor for the work accomplished.

In addition to the proper definite weight that should be carried on the bit, it is equally important that this weight be uniformly maintained. Otherwise there will be periods when the weight is excessive, thus inducing drill-pipe fatigue and having a tendency to drill a crooked hole; and, as the bit drills ahead, the weight carried becomes less than is proper. During these last-mentioned periods hole is being made at a slower rate than normal. It is also true that if the selected weight is that at which the tool cuts most efficiently, then during periods of excessive weight the cutting rate may be low while other undesirable conditions obtain.

Experience seems to indicate that at least 40 feet of drill collar should be used under any circumstances at any time, and that the proper length for most general service seems to be 120 feet. These lengths are not arbitrary; but it so happens that, because of the heavy cross-section, they are sufficient to permit the proper weights to be carried on the cutting tool with a reserve for maintaining the drilling shaft in tension.

Drilling Feed

With the bit rotating on bottom, it is now necessary to lower it as it cuts headway into the formation. Regardless of how it may be accomplished, the ideal feed is one that maintains a constant weight on the bit and imparts to it a perfectly uniform rate of descent into a given formation. This rate of descent is the resultant of various factors of the operation against the material being cut. A uniform feed, whether automatically or manually controlled, assures that the bit is resting on bottom with the desired weight 100 per cent of the time—no intermittent feed can possibly approach this efficiency. Shocks to the cutting edges of the bit are avoided by maintaining a steady pressure on the bottom of the hole, rather than by feeding off an excessive weight and then drilling off to insufficient weight—which is a natural result of any but a perfectly smooth and regular feed.

In uniform formations, where some feeding device that will do this job is used, the maximum weight that can be carried to maintain the desired straightness of hole is set, the other functions of the rig adjusted as required, and the equipment drills at maximum efficiency. In beds of alternating hardness, where the cutting tool passes from soft formation into contact with a hard formation, since the speed of descent is relatively slow, it may be decreased before excessive weight has been taken on by the bit. This protects the cutting edges of the tool, and lessens the inducement of fatigue in the drill pipe which would occur when the intermittent-type feed slips off too much weight onto the bit as the hard bed is encountered. With the feed having been caught before the bit takes excess weight, bends in the drill pipe—with the consequent tendency for the bit to go off from perpendicularity—are avoided.

Drill Collars

At the lower extremity of the drill pipe are placed "drill collars" or "bit collars." This part of the shaft has three primary functions: (1) to supply weight for the bit; (2) to hold the drill pipe in tension; and, (3) to stiffen the shaft at the lower end of which the cutting tool is placed. This means then, largely, that the length of drill collar to be run depends upon the weight to be carried by the bit. However, in such areas as the East Texas field, where some 20,000 wells have been drilled, 6 feet or 8 feet of drill collar is adequate—provided the fluid volume is sufficient—since the pumps do all the work and cut the formation away so rapidly that the bit never takes weight or, as the driller expresses it: "the bit cannot keep up with the hole." Assuming the use of drill collars weighing 100 pounds to the foot and the desire to carry 5 tons of weight on the bit, it is then necessary to use somewhat in excess of 100 feet of collar—just what this excess should be, I am not sure; but I will say that at least 50 per cent more than the weight to be supported by the bit, or maybe 100 per cent more, is necessary. This should assure that both the drill pipe and at least the greater part of the drill collar are in tension and hanging straight in the hole. The ideal string would have all the weight to be carried on the bit concentrated in the bit itself, and then additional drill collar for stiffness and momentum. We should approach this as nearly as possible.

It seems probable that too little thought has been given in the past to the eccentricity of the drilling shaft—with the result that the boxes, pins, and the bores of drill collars are not made with sufficient precision. A drill-collar bore that is not symmetrical will cause a wobble in this part of the shaft, and may eventually result in fatigue failure. Further, an eccentric drill collar will cause the center of gravity of the bit to rotate in a circle rather than as a point; consequently, the hole is enlarged, the dangers of crooked hole are increased, the gauge is worn from the bit, and the general drilling efficiency substantially reduced. The great importance of perfectly-balanced drilling shafts cannot be too strongly emphasized.

Reamers and Stabilizers

It is customary in some areas to run one or more stabilizers in the form of reamers. Where two are used, there is generally one immediately above the bit and the other 60 feet or 80 feet above. The practice has many advantages where the type of formation does not render it hazardous, and where round-trips are made with sufficient frequency that the danger of wearing out the cutter pins is inconsiderable. Another type of stabilizer that has been used, and which has many advantages, is a fluted guide having three or more bearing surfaces on the wall of the hole. These surfaces are faced with some hard alloy to prevent undue wear. It appears that this is the better type where the formations have a tendency to stick the pipe, or where round-trips are infrequent. The danger of losing a part of it in the hole is nil.

Although these reamers and guides have very decided advantages in certain formations, it is probable that in many cases their values are overbalanced by the dangers accompanying the running of the tool. They are serviceable; but, with the flexibility of the drill collar, they are probably not so valuable as guides in the drilling of straight holes as might be supposed. Reamers are extremely useful in bringing a hole to proper size after a bit that is out of gauge has been pulled, for smoothing the irregularities in the walls of the hole, and for cleaning the walls of excessive mud plaster before casing is run.

Rotating Speeds

As originally designed and operated, rotating mechanisms on rotary rigs permitted speeds varying from 30 to 60 r.p.m., and such speeds were maintained until the introduction of diamond-drilling equipment into the oil fields. These machines were designed to operate at high speeds and with very delicate weights on the bit, as a matter of protection to the diamonds set in it. The success of relatively high speed diamond-drilling machines in making hole in competition with the conventional rotary soon caused the operators of this conventional-type equipment to adopt higher rotating speeds and generally to improve the drilling methods. This statement may be doubted by many rotary operators; but, nevertheless, it seems to be true. There have for years past been a sufficient number of diamond-drilling machines of the old and later types scattered throughout the oil fields—where they have come under the observation of oil-field operators—to have permitted a relatively wide and rapid dissemination of the principles of their operations. The early rotary machines had then, and still have, a substantial disadvantage of chain- and sprocket-driven tables; however, new equipment has been perfected that eliminates this very objectionable and practical speed-limiting feature, and permits safe rotating speeds as high as 250 r.p.m. or higher.

The first question in the mind of the average operator is whether the drilling shaft will stand such speeds. It seems that if the drilling shaft is balanced and true and the hole is straight, the faster the rotating speed within practical limits, the greater the momentum of the pipe in rotation and the less severe the shocks imparted to it by the cutting tool on bottom in encountering inequalities in the formation. Rotating speeds must be adapted to the type and size of the bit in use, and to the nature of the formations which they are cutting. Generally speaking, probably 100 r.p.m. is as slow as any bit should be rotated, except under some very unusual conditions. The larger drag bits, from 17-inch up, if they are used at all, should be turned at rates approximating but not exceeding 100 r.p.m. because of the greater likelihood of becoming stalled in the hole and the consequent danger of stall-shock fatigue or actual failure in the drill pipe and breakage of the bit. The smaller-size bits of this type may, and in many cases should be, rotated as fast as 250 r.p.m. The proper speeds for rock bits depend largely upon the nature of the formation being drilled,

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and should vary from probably 100 (or in some cases less) up to 250 r.p.m. This latter speed is used in actual practice in one of the most difficult drilling areas with better results than for any slower speed; in fact, the rate of penetration of the bit varies almost directly as the speed of rotation.

On a rig using these rotating speeds, it is assumed that adequate drill collar will be in the drilling shaft in order to hold it in tension and to assist in the drilling of a straight hole. This heavy drill collar lends sufficient momentum to the pipe or cutting tool in rotation that any ordinary inequalities in the hardness of the rock are smoothed out.

Means of Rotating

With the bit on bottom, and having selected a table speed, it is now necessary that it be rotated. The first machines of the rotating, fluid-circulating type designed for the purpose of boring holes into the earth were diamond drills. The prime movers of these units were small reciprocating steam engines, geared to turn the drill pipe or rods at relatively high speeds. The delicacy of this rotating power and the absence of heavy rotating parts in the engine resulted in the development of minimum drill-pipe fatigue, with a consequent minimum of failures or break-offs, and a minimum of shocks to the bit. When the first rotary-drilling rig was assembled, the only steam engines available were of the single-cylinder type with relatively heavy fly wheels. This prime mover had to serve in the operation of the hoisting equipment and in the operation of the rotary table. From this crude beginning have been developed the present-day splendid engines, rotary tables, and powerful drawworks. These heavy engines built of a size necessary for the desired hoisting speeds are geared down to operate the rotary table at the required rates. The bit is rotated on bottom, encountering formations of various hardness and attitudes; while the momentum of the moving parts of the large engines, shafts, sprockets, and chains subjects the bit and drill pipe to heavy shocks as the bit encounters harder formations—thus inducing fatigue, destruction of the cutting edges of the tool, and probably many bit breakages. It would seem that a more delicate rotating power would relieve the drill pipe of appreciable work—thus materially increasing its useful life, and greatly decreasing fatigue failures and consequent fishing jobs and also decreasing bit wear and breakage. This type of rotating power can only be touched upon here. Suffice it to say that machines using relatively small and delicate rotating engines seem to give much greater useful life to drill pipe and bits and, it is believed, likewise drill straighter holes with the same weight.

The subjects of drill-pipe fatigue and failure have been considered at length, because the drill shaft is without question the limiting tool in the drilling of a well—and, consequently, every other factor in the operation should be brought to its maximum efficiency value in order to permit the drill pipe to reach its fullest possible accomplishment without undue labor.

The subject of drill-pipe length is important. The expense involved in measuring drill pipe in and out of the hole and the cost of errors made in mismeasurements are rather astounding when they are thoroughly analyzed. Joints of drill-pipe lengths that are uniform to within one-half inch or less will entirely eliminate these errors and additional well costs, and it would not greatly burden the pipe manufacturers to furnish them. It would require, however, slight changes in the dimensions now in use. For example, 7-inch could be used instead of 6⅝-inch. Enormous quantities of 7-inch grade "D" casing are manufactured; it would not be very difficult to grade this pipe for lengths of a satisfactory maximum variation for each string were this size to be used for drill pipe. A selection could again be made after upsetting, with the result that tubes of uniform lengths could be easily furnished and at very little, if any, additional cost. The same principle holds for smaller-size drill pipe.

Mud-laden Fluid

Mud-laden fluids as used in the drilling of wells must serve numerous purposes, some of which are diametrically opposed to others—thus necessitating many compromises and the consequent use of fluids that are not entirely suited to all of the conditions that must be overcome or controlled. The more important functions of good drilling mud are: the removal of the displaced formation or cuttings from the path of the bit and up the hole to the surface; the cleaning and cooling of the cutting tool; the actual jetting of formation from the bottom, thus acting as a hole-making agent; protection of the walls of the hole from caving; prevention of flow of fluids or gases from the formations into the hole; and to supply sufficient pressure to control any of these fluids or gases which may be present under high rock or hydrostatic pressures. When upward movement of the fluid in the hole ceases for any reason, it must hold the cuttings in suspension without permitting settling back, and yet drop its burden into the ditch or pits when shaker screens are not used. The drilling fluid must "mud-off" or seal porous formations against gain or loss of fluid, and yet must not permanently mud-off oil or gas sands. Further, the fluid must have a minimum corrosive and abrasive action on the parts through which it passes, and must actually act as a lubricant for the roller bearings used in some types of bits. Some of these points will now be considered further; but first, and in order that these mud-laden fluids and their properties may be more readily discussed and fully described, I should like to propose a new term, viz.:

"Saturated fluid suspension": The point of saturated fluid suspension is at that proportion between a given mud-forming solid and water of which there is no free water content and at which additional dry clay can only be held in suspension through mechanical agitation; or it is reached at that mixture of mud-forming solids and water at which it loses its fluidity and attains plasticity, provided more solids in the form used are added; or, it is the point beyond which mud-laden fluid ceases to be pumpable.

All raw mud-forming materials have a definite point of saturated fluid suspension; which is to say, mud-laden fluids of very definite weights

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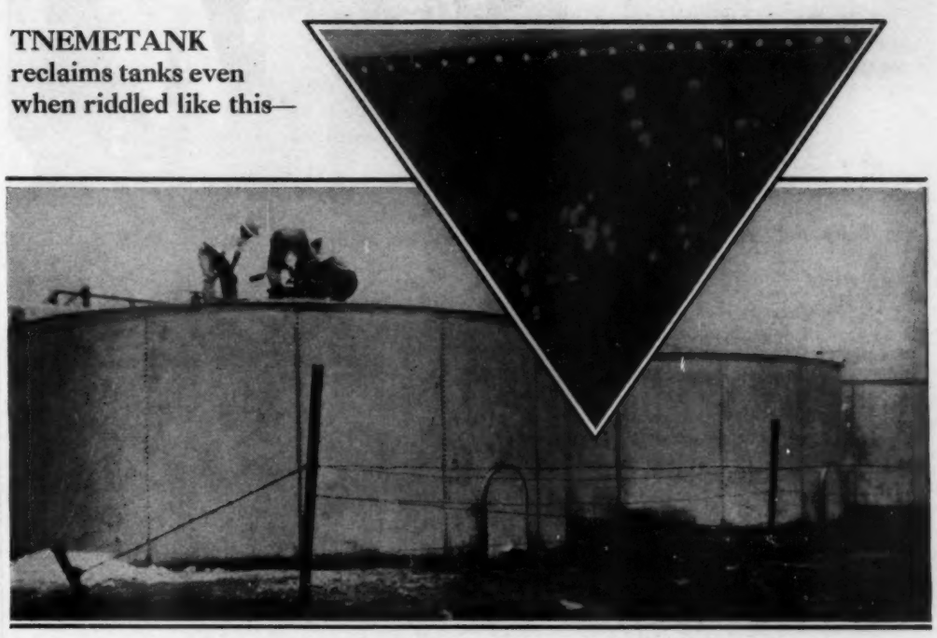

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only can be made of them. This point is controlled by the colloidal properties and the specific gravity of the materials. Because of this, it follows that the higher the colloidal properties of a given mud-making material, the lower the weight at the point of saturated fluid suspension; while, conversely, the lower the colloidal value of the material, the higher the specific gravity of the mud-laden fluid up to the maximum that can be formed by the pulverized mineral or clay being used. The extreme on the low side is some such material as pulverized bentonite, which reaches this point of saturated fluid suspension (in this case semi-solution) at minimum specific gravity for such a fluid. The other extreme of the materials ordinarily used is oxide of iron, which attains the maximum specific gravity at its point of saturated fluid suspension. Between these extremes there are limitless combinations which may be controlled at will by the proper proportioning of the colloidal matter and the pure clays or other minerals.

For the removal of cuttings from the hole and for cooling and cleaning the bit, the lightest mud that, at the upward velocity given it by the pump, can float the cuttings out is satisfactory; but in order that its burden may not settle back toward the bottom when the pump stops, it must be sufficiently viscous through gelling to hold the cuttings in suspension, or at least to permit relatively slow settling. If this fluid is to serve the bit as sticky shale or gumbo is being penetrated, then it must be substantially below its point of saturated fluid suspension in order that more mud-forming particles may be taken up.

In the protection of shale walls from caving, weight and the ability to "set" or gell as movement ceases are required; i.e., a mud made of high-specific-gravity clays with fair colloidal properties should be used. If sands are to be "mudded" off, then muds built of clays having high tensile strength in plastic form are most suitable. As the drilling fluid passes upward through the hole, the fluid velocity at the wall is substantially less than in the center of the hole; in fact, in immediate contact with the wall there is no movement. This part of the fluid against the sand loses some of its water to the sand, until its point of saturated fluid suspension is exceeded and the mud attains plasticity. This desiccation of the mud to the point of plasticity continues, and the plaster thickness increases. This is particularly true in deep holes where desiccation seems to be more rapid than at shallower depths. Above some unknown depth, the plaster does not seem to build up to that thickness which is likely to give trouble; but at greater depths, such as in the Temblor sands of Kettleman Hills, desiccation is so rapid that even after a few hours' time the plaster thickness is such that the bit has to be pulled through it and, occasionally, a "ball" is built up on the tool that makes it necessary to rotate and circulate out. This is particularly true if high-tensile-strength clays are used. The more nearly pure, lightweight aluminum silicate clays form plaster coatings of low tensile strength in deep holes and seem to be better adapted to the conditions than heavy clays high in iron oxide. A low-specific-gravity clay that forms a mud-laden fluid that reaches its point of saturated fluid suspension at about 74 pounds seems to be the best yet used for deep-sand drilling. A weight of about 73 pounds per cubic foot and a viscosity of about 30 seconds (Marsh funnel) seems to be the correct mixture. Further, these low-specific-gravity, low-tensile-strength, highly-colloidal clays are more readily cleaned from the producing sands than are those of high tensile strength in plastic form. The actual permanent mudding-off of production seems doubtful under normal conditions, particularly when brittle clays are used. Penetration probably rarely exceeds a small fraction of an inch; and when the pressure of the fluid column at the bottom of the hole is decreased by bailing or swabbing, it seems probable that the sands are cleaned of all foreign mud particles.

As drilling depths increase, desiccation of the drilling muds will probably likewise increase. It would be extremely interesting to see some of the deeper wells drilled into the producing horizons with fairly viscous muds built of low-specific-gravity clays with mud weights just sufficient to counterbalance the pressures in the sands. The

(Continued on Page 221)

The Economic Life of Sucker Rods

By EMORY KEMLER
Gulf Oil Corp., Tulsa*

The evaluation of sucker-rod service and the determination of the economic life of any particular string of rods require a knowledge of the behavior of the rods under operating conditions. To be able to determine the time when rods should be replaced, it is necessary to know what would happen if the rods were to remain in service; i.e., it is necessary to have some analytical relation between the number of failures and the days of service. This paper gives a general law which has been found to give the relation between the number of failures and the days of service. This law has been used to derive a formula which gives the economic life of the rods. With the collection of more detailed information, it should be possible to determine the effects of speed, stroke, corrosion, loads, etc., on rod failures. A preliminary study of field records of test strings of sucker rods indicated that the number of failures could be expressed in the form of:

$$N = bT^m,$$

where N represents the number of the failure and T represents the time at which the nth failure occurred, b and m being constants which determine the character of the curve showing the relation between the number of the failure and the time at which it occurred.

Since a curve which can be expressed in the form as given above becomes a straight line when plotted on log-log paper, a large number of the records on test strings was analyzed by plotting the number of the failure against the time in days which the rod string had been in service. The slope of the straight line on log-log paper becomes the exponent of T, and the coefficient b becomes equal to:

$$\frac{1}{T_o^m}$$

where T_o is the time at which the first failure occurs, provided the initial failures follow the general law. T_o can be found by extropolating the curve found to hold during the latter part of the life of the rods until this curve hits the time line at $N = 1$. Figures 1 and 2 show typical results obtained from field tests of rod strings. It will be seen that most of the curves given in these figures follow, with a surprising degree of accuracy, a straight line, particularly after the first few failures.

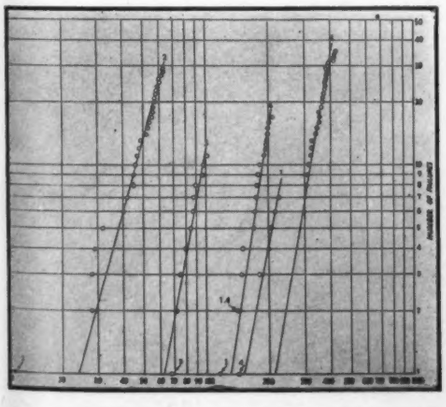


Fig. 1—Plot showing number of sucker rod failures versus days' service

In many cases the initial failures may occur earlier than the curve, which is based on the behavior during the latter part of the life of the string, would indicate. This is no doubt due, in many cases, to the fact that a few rods in the string have defects due to poor material or improper manufacture; and, after these few initial defects have been eliminated from the string by failures, the rod string then follows a consistent law.

A.P.I.—Presented Mid-Year meeting of American Petroleum Institute, Tulsa, May 14, 1936.

Discussion of Law of Rod Failures

The actual plot of rod failures against the hours' operating time cannot be expected to follow too closely the average curve, because the time which the rods were in service is not accurately known. In some cases there may be considerable down-time due to proration, excessive tubing failures, rig troubles, well clean-out, etc., which are not reported on the records. Also, there may be changes in operating conditions, particularly where the test string has been in service for several years, resulting from changes in corrosiveness of fluid, changes in subsurface conditions which require different operating speeds and strokes, changes in well condition due to work-overs, plugging back, etc., changes in subsurface conditions which may result in less gas (which will no doubt result in increased rod loads), and many other similar factors which will influence the behavior of a string of rods.

Many of the curves studied show definite characteristics resulting from specific operating conditions. For instance, curve No. 2 (Figure 2) shows what happens when there are changes in well or operating conditions. Curve No. 1 (Figure 1) shows a jump in time after the seventh failure before resuming the same trend. The first few failures may have been hastened by defects, or there may have been some changes in well conditions or possibly considerable down-time due to reasons enumerated earlier. Curve No. 1 (Figure 2) is typical of conditions where corrosion progresses uniformly and finally reaches a stage where many of the rods become over-stressed. At that time the failures occur rapidly, and the curve has a very steep slope.

The other curves follow with surprising accuracy a straight line throughout their life. The wide range of conditions and fields which the test strings covered makes it safe to use the law for general analysis of problems of selection and use of rods.

A general analysis as to the variations in slope and the value of T_o was not attempted because of lack of complete information as to well loads, data on the corrosiveness of the fluid, crookedness of the hole, and similar factors previously mentioned.

The gradual introduction of dynamometers in the field and the collection of complete data on well loads, corrosiveness of the fluid, and other factors will do much to explain variations in the exponent m and the constant b or T_o.

This analysis is by no means complete, but it serves as a step toward the solution of the more general problem of rod failures, and serves as a basis for carrying out general studies on the valuation of rod service and economic life of rods.

Economic Life of a String of Rods

The cost of a string of rods at any time T will be equal to depreciation plus interest, insurance, profit, etc., plus cost of replacing rods plus value of lost production. Expressed analytically:

$$\text{Cost of rods} = (C - C_s) + \frac{Ci}{365}T + C_rN + C_oN$$

$$= (C - C_s) + \frac{Ci}{365}T + (C_r + C_o)N \quad (1)$$

Where

- T = days rods have been in operation.
- N = number of failures to time T.
- C = initial cost of rod string. Includes cost of rods plus cost of delivering rods to well plus storage charges plus cost of installing rods in well.
- C_s = salvage value of rods.
- C_r = cost of replacing a rod in a well = cost of new rod plus cost of labor in making the replacement.
- C_o = value of oil lost during down-time or may include loss resulting from water intrusion in wells which takes several days to get back to regular rate.
- i = interest rate plus insurance plus any other investment charges.

A_c = average cost per day.

The average cost per day at time T then becomes:

$$A_c = \frac{C - C_s}{T} + \frac{Ci}{365} + (C_r + C_o)\frac{N}{T} \quad (2)$$

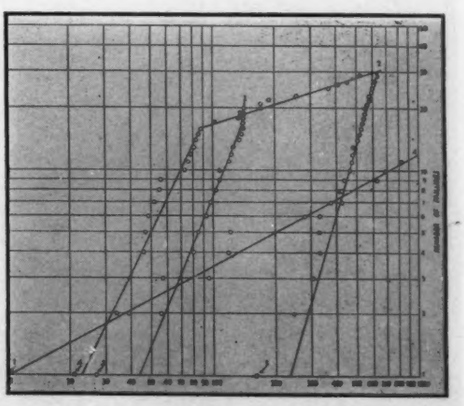


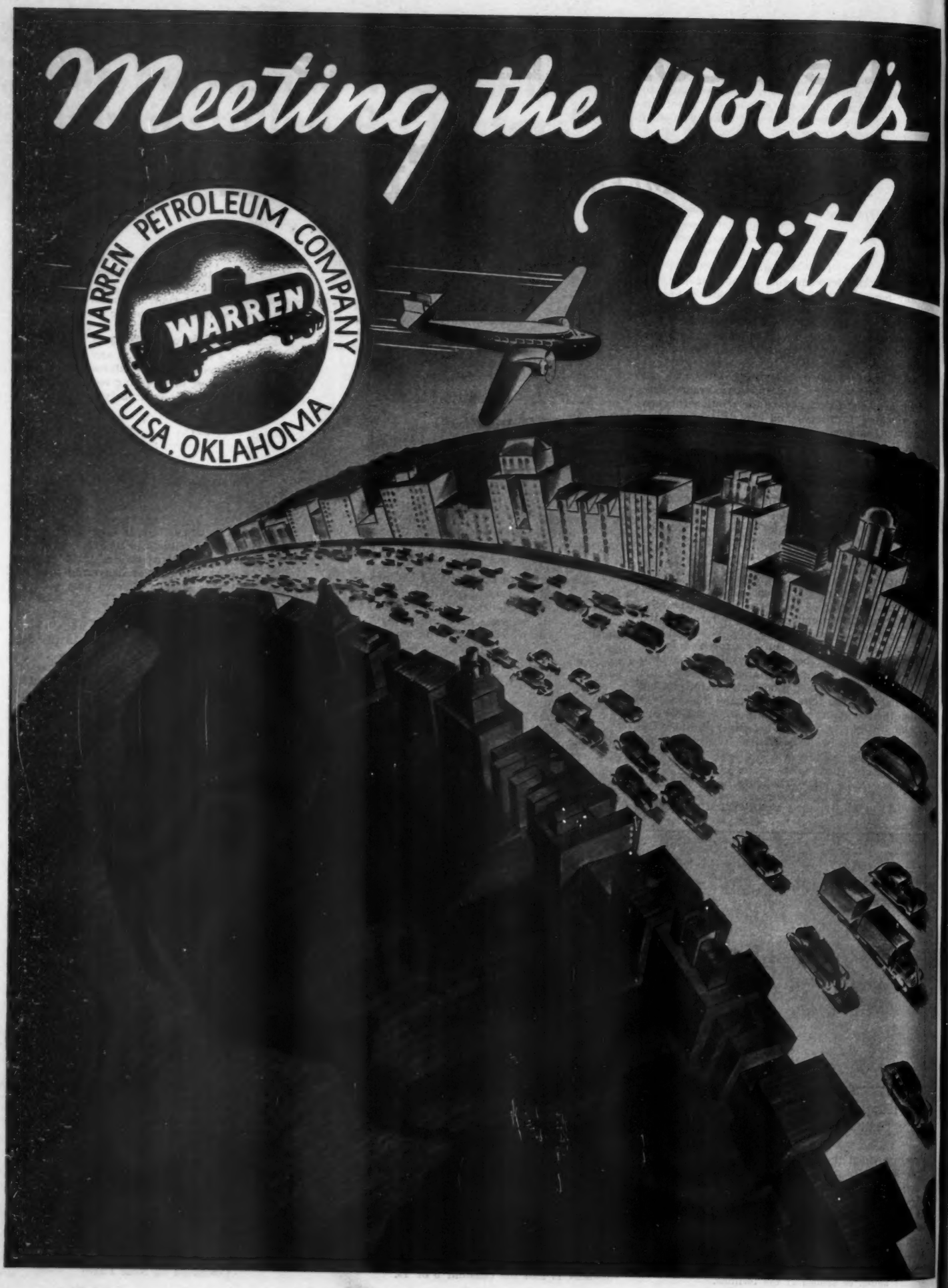
Fig. 2—Plot of sucker rod failures versus days' service showing how operating conditions may affect life of the rod

If the relation between N and T follows the law:

$$N = bT^m \text{ or } T = \left(\frac{N}{b}\right)^{1/m} \quad (3)$$

(Continued on Next Page)

*The statements and opinions expressed herein are those of the author, and should not be construed as an official action or opinion of the Institute.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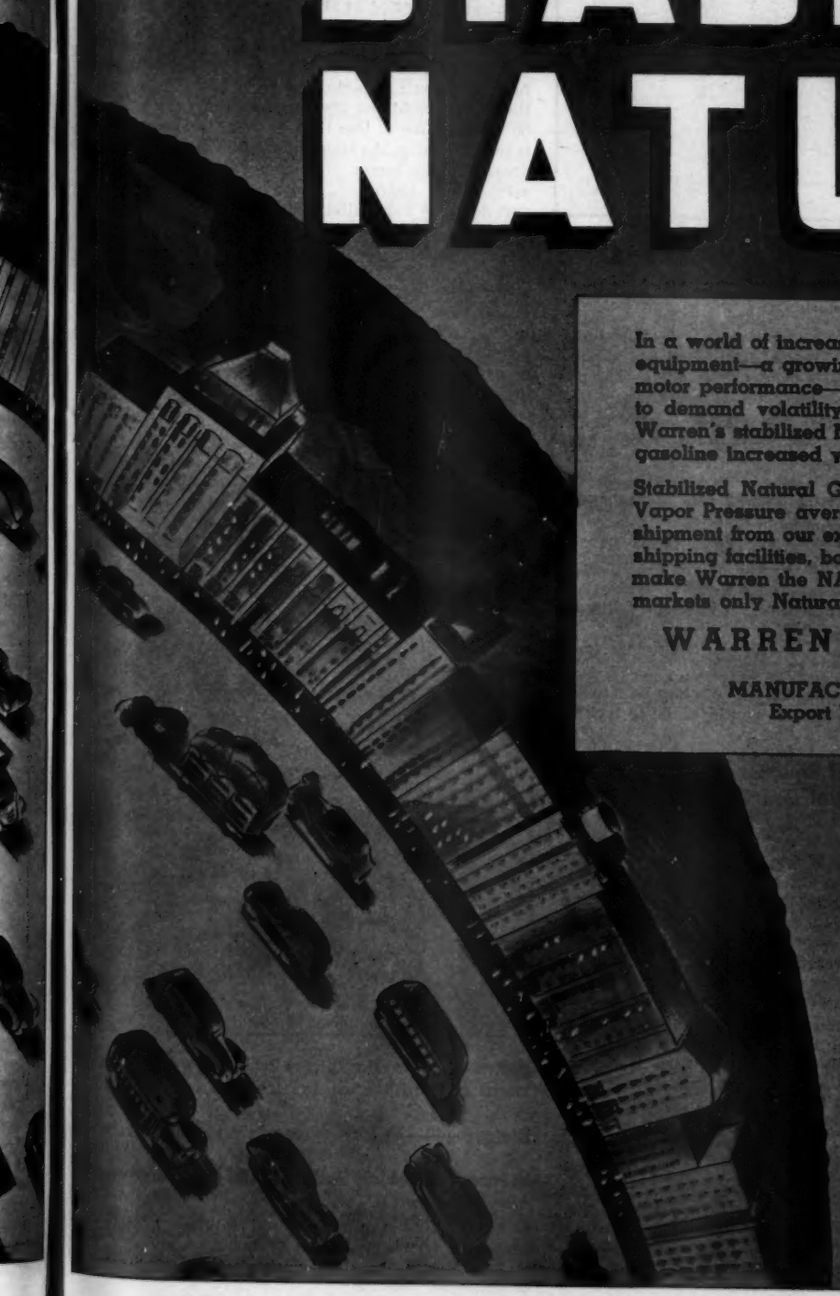

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$$A_c = \frac{(C - C_s)b^{1/m}}{N^{1/m}} + \frac{Ci}{365} + \frac{(C_r + C_s)Nb^{1/m}}{N^{1/m}}$$

$$= (C - C_s)b^{1/m}N^{-1} + \frac{Ci}{365} + (C_r + C_s)N^{m-1/m}b^{1/m} \quad (4)$$

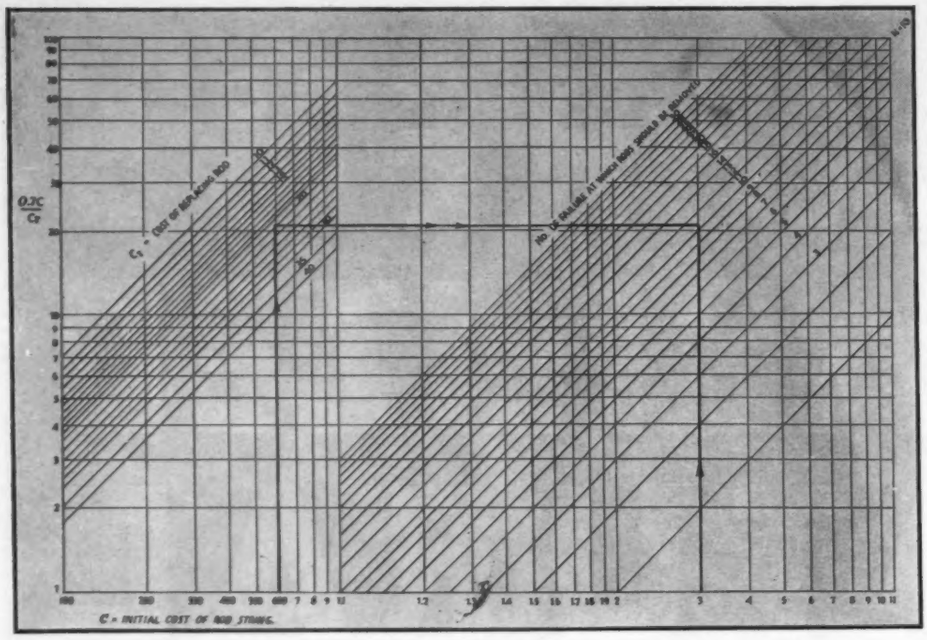

Fig. 3—Chart for determining failure at which sucker rods should be removed

If A_c is to be a minimum:

$$\frac{dA_c}{dN} = 0 \quad (5)$$

$$\frac{dA_c}{dN} = (C - C_s)b^{1/m}N^{-1/m-1}\left(\frac{-1}{m}\right) + 0 + (C_r + C_s)N^{-1/m}\left(\frac{m-1}{m}\right)b^{1/m}$$

Setting:

$$\frac{dA_c}{dN} = 0: \quad (C - C_s)b^{1/m}N^{-1/m-1}\left(\frac{-1}{m}\right) + (C_r + C_s)N^{-1/m}\left(\frac{m-1}{m}\right)b = 0$$

Or:

$$-(C - C_s)N^{-1} + (C_r + C_s)(m-1) = 0 \quad (6)$$

$$N = \frac{(C - C_s)}{(C_r + C_s)(m-1)} \quad (7)$$

If the salvage value of a string of rods is taken as 30 per cent of their initial value, $(C - C_s)$ becomes 0.7C, and the formula reduces to:

$$N = \frac{0.7C}{(C_r + C_s)(m-1)} \quad (8)$$

To find the time at which the rods should be replaced, the same procedure can be followed—except that N be eliminated from equation (2) and the derivative be taken with respect to T. The resulting equation can be conveniently expressed in the form:

$$T = T_s N^{1/m} \quad (9)$$

Where T_s is the value of T at which $N = 1$ if the law $N = bT^m$ is followed, T_s is, therefore, the point where the straight-line curve hits the time axis where $N = 1$.

Another question which might be of some interest is the time at which the average cost per day of using a string of rods equals the average cost per day just before the first failure occurred. To obtain this, it is necessary to set the average cost at time T_s equal to the average cost at any time T later.

This gives:

$$\frac{0.7C}{T_s} = \frac{0.7C + NC_r}{T} \quad (10)$$

Substituting equation (9) in (10), we get:

$$\frac{0.7C}{T_s} = \frac{0.7C + NC_r}{T_s N^{1/m}}$$

Or:

$$N - \frac{0.7C}{C_r} N^{1/m} + \frac{0.7C}{C_r} = 0 \quad (11)$$

This equation is not easy to solve except for $m = 2$ and $m = 3$. It is possible, however, to obtain solutions for the value of:

$$\frac{0.7C}{C_r}$$

If N and m are given, by working out values of this economic factor $\frac{0.7C}{C_r}$ for various values of N and m, curves can be plotted. C_r has been used, since C_s is additive and C_r can be made to include both if desired.

Discussion of Equation for Economic Life of Rod Strings

Formulas (8) and (9) give, respectively, the number of the failure and the time at which the cost of a particular string of rods becomes a minimum. The problem of determining the economic life of a string of rods is somewhat different from that commonly encountered in determining the economic life of a piece of equipment. In the case of the rod string, straight-line depreciation was assumed; however, the depreciation rate cannot be determined until the economic limit of the rod string has been determined. Fortunately, the formulas are of such a nature that this factor can be handled analytically much easier than it can be used in the step-by-step calculations.

It will be noted that the formula for the number of the failure at which the rod should be replaced involves only one factor which depends on the law which the failures follow—this factor being the exponent m, which is the slope of the time-failure curve plotted on log-log paper. The time at which the cost of the rod string becomes a minimum, however, involves T_s, which depends on the constants b and m. N can, of course, be replaced in equation (9) by its value in equation (8) if desired.

Formula (8) shows that the value of the lost production, or any expenses incidental to deferred production, has the same effect on the economic life of the rods as the cost of replacing the rods. Ordinarily, the factor C_s will not enter into the problem, as the production is not lost, but merely deferred. In some wells which have to be pumped for several days after being down due to rod troubles, before the oil production becomes normal, a considerable charge might be made which will include operating expenses for the time necessary to get oil production back, plus interest on the investment of the rig during the down-time.

The variation of the economic number of failures with the exponent m is very interesting, particularly when considered in relation to the plot of the number of failures versus day's service, as shown in Figures 1 and 2. If m is 1, N becomes infinite. On first analysis, the formula appears to be inconsistent for this value of m; but the geometrical meaning of m explains this apparent inconsistency, and shows the formula to be correct. If $m = 1$, it will be seen that the time between failures is equal throughout the life of the rods. For instance, if the second failure occurred 10 days after the first failure, the twenty-first failure would occur 10 days after the twentieth failure, and so on. If, therefore, the rods can be economically justified at the time of the first failure, they can be justified at any time during their life. Rods following such a law should, therefore, never be removed unless some new rod, which will not fail, becomes available. Obviously, if for $m = 1$ the rods should not be removed, they should not be removed for m less than 1. If m is less than 1, it indicates that the time interval between rod failures becomes larger the longer the rods are in service and, therefore, the average cost per day will decrease indefinitely with time. For this case, it is also obvious that the rods should never be removed.

Curve No. 8 (Figure 2) shows a well where this apparently impossible condition exists. The wells in this field present an unusual condition, however, in that the rods become coated with calcium carbonate, and this coating protects them from corrosion. Apparently, the effectiveness of this coating increases with time, resulting in the peculiar condition that the rod failures become less frequent with the increase in service. For normal rod strings where m is greater than 1, it is seen that

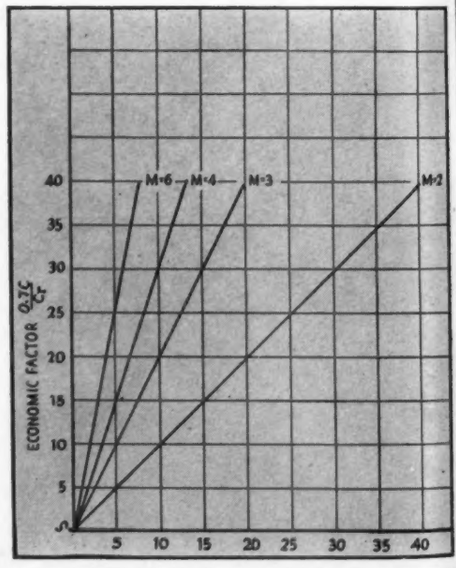

Fig. 4—Curve showing relation between economical number of failures and economic factor $\frac{0.7C}{C_r}$ for determining number of failures at which rods should be removed

after the first failure the rod failures increase with time if the law $N = bT^m$ holds.

The formula has been derived to apply only to

the determination of the economic life of a particular rod string. To compare one rod string with another, the formula is also useful. A rod string cannot be properly evaluated with reference to some other rod string unless both are compared at the point where their average cost is a minimum. In such cases, N and T, at the point where the cost per day is a minimum in each case, can be deter-

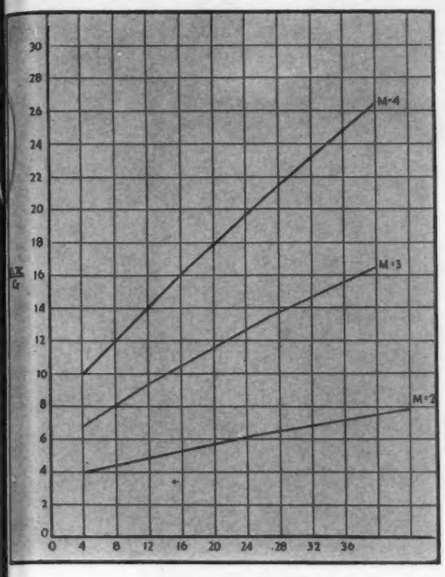

Fig. 5 — Curves for determining number of failures at which cost per day equals cost per day at first rod failure

mined, and the rods can be compared by using the formula:

$$\text{Average cost, } A_c = \frac{0.7C + C_r N}{T}$$

Interest and other charges need not be considered unless the investment C is quite different in each case and the interest rate i is high. The formula shows that the number of failures at which the rods should be discarded will vary with the cost of making replacements. If the cost of making replacements is low, the rods should be used for a relatively long time; whereas if replacement costs are high, the rods should be replaced early. Also, more expensive rods can be operated for longer periods of time than the less expensive rods.

Application of the Formula for Economic Life of Rod Strings

In order to make equation (8) more easily applicable, Figure 3 has been constructed. For convenience, the scale for m has been placed on the bottom, thus requiring more trouble in locating the value of N; but, since N has no practical significance (unless expressed as a whole number) the diagonal scale has been made for N.

To use the chart, enter on the bottom of the scale at the value of C = initial value of rod string; trace up to C_r = the cost of replacing a broken rod; and then trace across until this line intersects the vertical line for the particular value of m to be used, and read the value of N. In the example shown on the chart, C = 600, C_r = 20, m = 3, and the value of N is found to be 11.

Figure 4 shows how the economic failure varies with the economic factor $\frac{0.7C}{C_r}$, and with m. Figure 5 shows the number of failures at which the cost per day equals the cost per day at the time of the first failure. This value has little significance, and has been included as being of casual interest only.

Table 1 shows a numerical example based on the rod-failure curve shown in curve No. 4 (Figure 4). The number of failures at which the cost will be a minimum has been taken as the one above where the intersection occurred. For this reason, the economic limit for C_r = 30 appears to be the same as the cost at the first failure. The rod

TABLE 1—APPLICATION OF FORMULA TO CURVE NO. 4 (FIGURE 1)[1]

C_r[2]	N[3]	T[4]	A_c[5]	Cost at time T.	Cost at end of 15 failures (200 days)	Saving by scrapping at time T
10	6	172	2.65	3.10	2.72	14
15	4	160	2.85	3.10	3.10	50
20	3	152	3.00	3.10	3.48	96
30	2	143	3.10	3.10	4.23	226

[1]Initial cost of rods assumed at $395.
[2]C_r = cost of making replacement.
[3]N = failure at which aver. cost is a minimum.
[4]T = time at which cost is a minimum.
[5]A_c = average cost per day for life of rods.

string, for purpose of comparison, has been assumed to be thrown away at the end of 15 failures, or at the end of 200 days; and the amount that would have been saved by replacing the rods at the economic limit is shown in the last column for different values of C_r. It is seen that little saving can be made if C_r is small, but the saving becomes quite large as C_r increases. These examples show in a very general way, how the formulas can be applied but do not attempt to set any definite limits. These will depend on the various economic factors which vary from district to district.

Acknowledgments

The writer wishes to express his appreciation to R. J. S. Pigott and B. B. Wescott for their helpful discussions on this problem, and to P. D. Foote for permission to publish this paper.

Rotary-Drilling Practices

(Continued from Page 216)

presence of considerable gas may offer problems in the test.

Substantial progress has been made recently in the treatment of mud-laden fluids with chemical reagents to promote some desired physical character, such as those used to reduce viscosity by control of the colloidal properties of the fluid. No chemical for field use seems to have been found that will impart to the mud that character given it by the colloidal properties of a clay or hydrous mineral such as bentonite. Other reagents, such as lime and sodium silicate, are used for special problems where a very stiff non-pumpable mud is required. These are usually spotted where needed in the hole.

Summary

The fluid delivered to the bit is of primary importance in both volume and character.

Assuming the proper cutting tool is being used, probably the next most important factor in the drilling operation is the weight supported by the bit. Weight to be carried is controlled by the size of the cutting tool, the size and strength of the drilling shaft, the weight of the drill collar, rotating speed, fluid volume, and the nature and attitude of the formations being penetrated. In many formations the greater the weight, the more rapidly hole can be made—all other factors being adequate, and within the limitations of the other requirements. This is not true, however, in all strata; the much discussed Brown shale of Kettleman Hills being a case in point.

Another extremely important factor is rotating speed; while its subsidiary, torque, is likewise important as affecting the work capacity of the drilling shaft.

The proper type and dressing of the bit is, of course, necessary to efficient drilling.

Each of the four factors is definitely controlled or influenced by the others; and, in order to obtain maximum economy and efficiency in any drilling operation, it is absolutely essential that all of them be applied in their proper balanced values. These values must be learned.

Expressed differently: for maximum drilling efficiency there is required an adequate volume of mud-laden fluid of the proper physical and chemical consistencies, the proper weight on the bit constantly and uniformly maintained, a regular and smooth feed or rate of descent of the bit into a given formation, a smooth and delicate rotating power—the most suitable bits for the materials being cut—and above all, intelligence in the selection and perseverance in the application and maintenance of these various factors in their correct values. It is doubtful whether anyone can say definitely what these values are or should be in any but very simple problems. I would urge the extreme importance of taking such steps that may be necessary to ascertain the proper values of these all-important factors of the process of boring a hole into the crust of the earth in the search of oil or gas.

Seek New Producing Fields in Central Illinois Counties

Recent leasing in Clay, Marion, and Effingham Counties in Illinois is the result of interest growing out of recognition that there exists there a situation similar to the one in the Mount Pleasant district in Michigan where the field is centrally located in a structural basin. The Mount Pleasant Basin where oil was discovered in 1927 is comparable in extent with the structural basin in the Illinois Basin.

This is designated as a coal basin coming up to a ridge to the west where there is shallow production. Sand is also found on the ridge to the east and it is expected in the basin in between Anticlines have been identified to some extent by the coal beds. However, coal strata used elsewhere in Illinois as structural key horizons cannot be definitely traced at present into the deeper parts of the basin. And although there is no known key horizon which can be used throughout the basin area, the position of the pre-Pennsylvanian unconformity can be recognized in some well logs. Irregularities at the base of the Pennsylvanian system are due to deformation and erosion of pre-Pennsylvanian strata previous to the deposition of sediments that now lie above and the subsequent warping by diastrophic movement.

During recent weeks there has been considerable leasing by the Carter Oil Co. and others in five blocks, ranging from 12,000 to 20,000 acres, in the vicinity of Dix Station, Jefferson County; Montrose, Effingham County; Omega, Marion County; and Oskaloosa, Louisville, and Xenia in Clay County.

Four structural closures have been named as follows: The two larger ones are designated as the Louisville anticline and the Omega anticline; the two smaller ones are the Iola and Xenia domes. This whole area lies between the La Salle anticline to the east and the De Quoin anticline to the west. There is expectation that oil may be found at a depth of less than 4,500 feet with possibilities in the Pennsylvanian, Mississippian, Devonian, Silurian, and Ordovician. At two places in southeastern Illinois wells drilled to the St. Peter, approximately correlated with the "Wilcox" of Oklahoma, struck salt water with a high degree of concentration (45,000 p.p.m. and 175,000 p.p.m. of dissolved solids), which would seem to encourage further drilling in the area. Leases taken are reported to be for 10 years, some with rentals due after the first five years and some with rentals due after the first year. Several seismograph crews have been shooting in these counties. No well location for a test has been announced yet.

The Illinois State Geological Survey has recently published a bulletin entitled, "The Geology of Oil and Gas Possibilities of Parts of Marion and Clay Counties, With a Discussion of the Central Portion of the Illinois Basin," Report Investigation No. 40, which is issued by the Department of Registration and Education, Division of Geological Survey, Urbana, Ill.

Gas Franchise Asked

NORTH BATTLEFORD, Saskatchewan, May 9.—C. H. Withers and associates are making application for a natural gas franchise for North Battleford. It is proposed to pipe gas from the Lloydminster field. The project involves a transmission line of between 75 and 85 miles with distribution system for the town, the outlay being estimated between $1,000,000 and $1,500,000.

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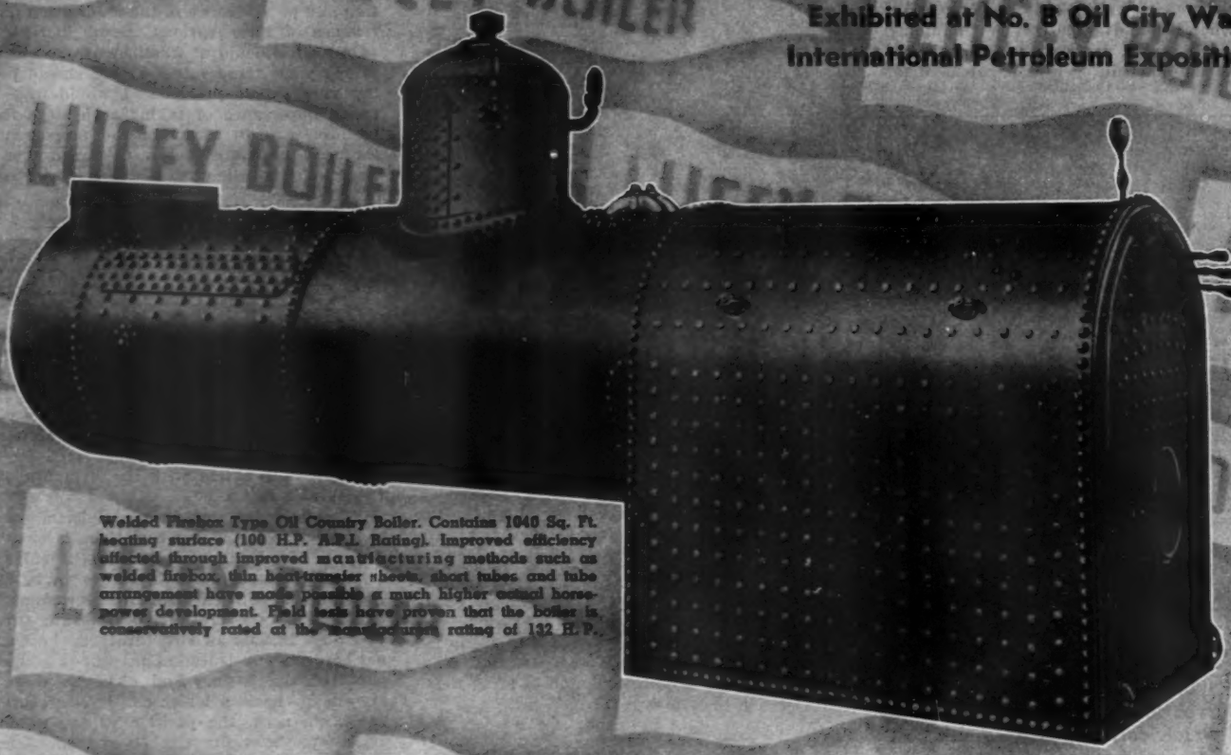

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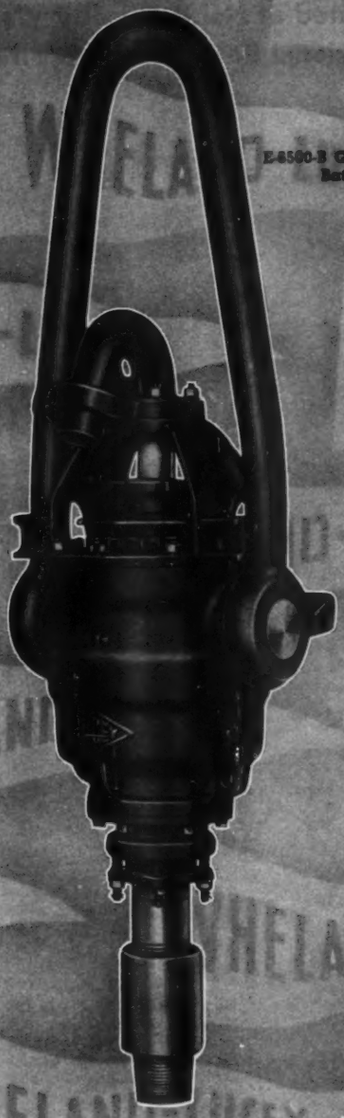

E-8500-B Gimo "Quad" Oil Bail Swivel.

K-7050-A 80" Five-Sheave Streamline Roller Bearing Traveling Block.

In-Line Type Roller Bearing Crown Block. Furnished with five or six Sheaves.

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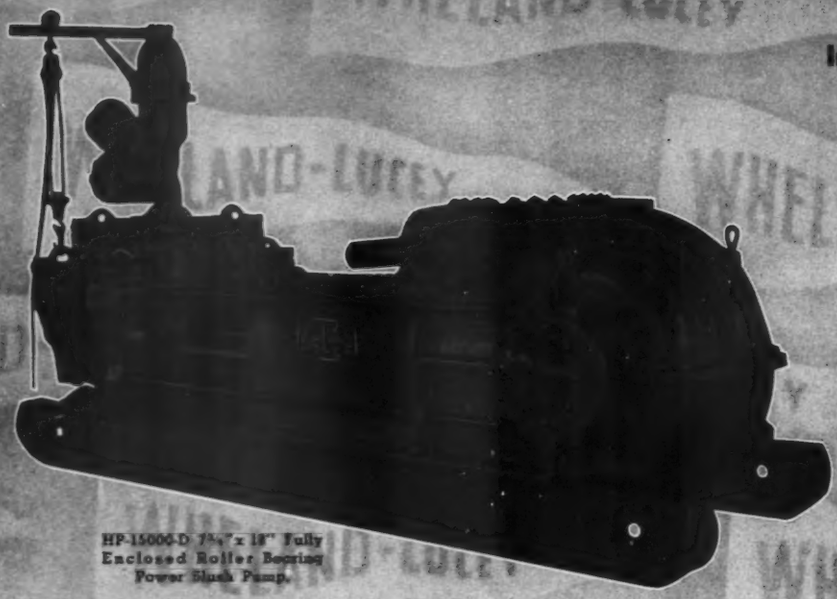

HP-15000-D 7¾" x 18" Fully Enclosed Roller Bearing Power Slush Pump.

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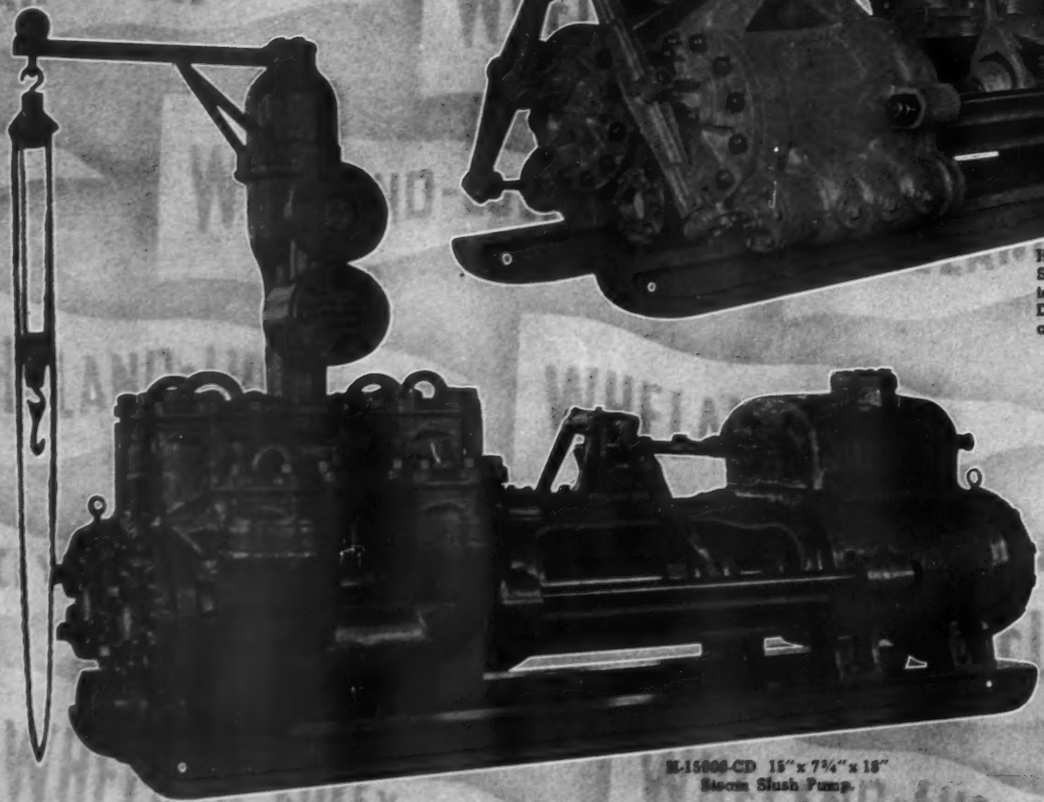

H-15000-CD 15" x 7¾" x 18" Steam Slush Pump.

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Lucey Products Corporation, Tulsa, Oklahoma.

Clay Treating of Motor Fuel

By M. R. MANDELBAUM and PAUL F. SWANSON
The Gray Process Corp. M. W. Kellogg Co.

The first commercial installation for the clay treating of motor fuel was made 12 years ago, in 1924. It represented a jump from a pilot-plant installation, charging a few pounds of fullers earth, to an 8-ton tower. It was predicted that 2,000 bbls. of cracked gasoline could be treated before it would be necessary to recharge the treating vessel. This would have been equivalent to a throughput of 250 bbls. per ton of earth.[1a] The

A.P.I.—Presented Mid-Year meeting of American Petroleum Institute, Tulsa, May 14, 1936.

intervening years of development are, in a sense, summed up by a run recently completed in a unit of four clay towers, with a charge of more than 100 tons of fullers earth, during which the throughput exceeded 27,000 bbls. of cracked gasoline per ton of clay.

There is no need to repeat here a detailed discussion of the theory of clay treating. As is well known, T. T. Gray[2] made the fundamental discovery that vapor-phase treatment of cracked gasoline with adsorbents of the clay type resulted in the polymerization of the objectionable unsaturated hydrocarbons, and that in this way a selective treatment could be achieved which would obviate the disadvantages of the then commonly-used refining agent—sulfuric acid.

Gray preferred to pass the vapors being treated through the adsorbent, and the commercial development of the Gray process continued in this direction.[3] Later, R. K. Stratford[4] found that the specific problem confronting him could best be solved by countercurrent treatment of cracked-gasoline vapors with a slurry of fine clay in naphtha; and Osterstrom achieved certain advantages for still another type of problem by subjecting the cracked gasoline to treatment under high pressure, thereby maintaining it in liquid phase at polymerizing temperatures. All three processes are in commercial use, but the latter two have until recently been limited in their application to the refineries of the companies in which they originated; while the Gray process, simpler and of more general adaptability, has received wider use. The magnitude of this is shown in Table 1 which gives, in round numbers, the commercial use (operating and under construction) of the three methods.

TABLE 1—CLAY TREATMENT OF MOTOR FUEL
(Operating and Under Construction)

	Barrels per day		
	United States	Other countries	Total
Gray process	125,000	15,000	140,000
Osterstrom process	16,000	500	16,500
Stratford process	.....	30,000	30,000
Total	141,000	45,500	186,500

This acceptance of clay treating has been encouraged by recognition of its advantages and economies: a refined cracked gasoline is obtained, improved as to color, gum, and stability; operating costs and losses are lower than those of other processes which achieve the same results; and there is no loss in octane number due to the treatment.

Descriptions and general flow diagrams of the three processes discussed, as well as summaries of the results obtained, have been published. The sections on the Osterstrom and R. K. Stratford processes, in the Cooke and Hayford paper,[5] are quite complete; and additional data on the former have been included in a recent paper by Morrell and Egloff.[6] One of the present authors, in a paper before the World Petroleum Congress[7] of 1933, gave considerable data on several applications of the Gray process as used to refine gasolines produced by cracking from various charging stocks under different treating conditions. Since that time developments of interest include additional data on the Gray process at elevated operating pressures. This paper is largely concerned with a presentation of this newly-available data.

Attempts to correlate the available data on the commercial practice of clay treating result in the conclusion that exact analysis or rigid treatment which would permit of generalized conclusions is not applicable, and that each example is a case by itself in so far as quantitative deductions are concerned. This is indicated, at first glance, by the fact that plants in commercial operation have reported clay life ranging from 800 bbls. to 27,000 bbls. per ton of earth. This divergence is due to a number of variables which we have designated, for convenience, as factors of "treatability," which involve the ease or difficulty of handling the individual product; "specifications," which include the requirements of each individual refiner; and "design," or allowable modifications in clay-treating equipment which will give the maximum permissible economy of installation and operation for any particular problem. These factors, which have been discussed in previous papers already referred to, can be summarized as follows:

Treatability Factors

(a) Base of crude: Ease of handling cracked gasoline increases with paraffinicity of cracking stock.

(b) Cracking charge: Gasolines from distillate stocks are easier to treat than those from residuals.

(c) Cracking conditions: The more severe these are, the greater the treating difficulty. Usually, drastic cracking conditions are indicated by high transfer-line temperatures and production of relatively high percentage of gas.

(d) Sulfur content in charge: This does not affect activity of clay as regards color improvement, gum reduction, etc.; but clay treatment under usual conditions of commercial application brings about little or no reduction in the sulfur content of the vapors treated.

Specification Factors

(a) Endpoint of cracked gasoline: This in turn affects color, gum, and induction period; but not in the same direction.

(b) Initial color: Most clay-treating operations use this property for control even when the resultant gasoline is to be dyed. Specification varies from 17 to 30.

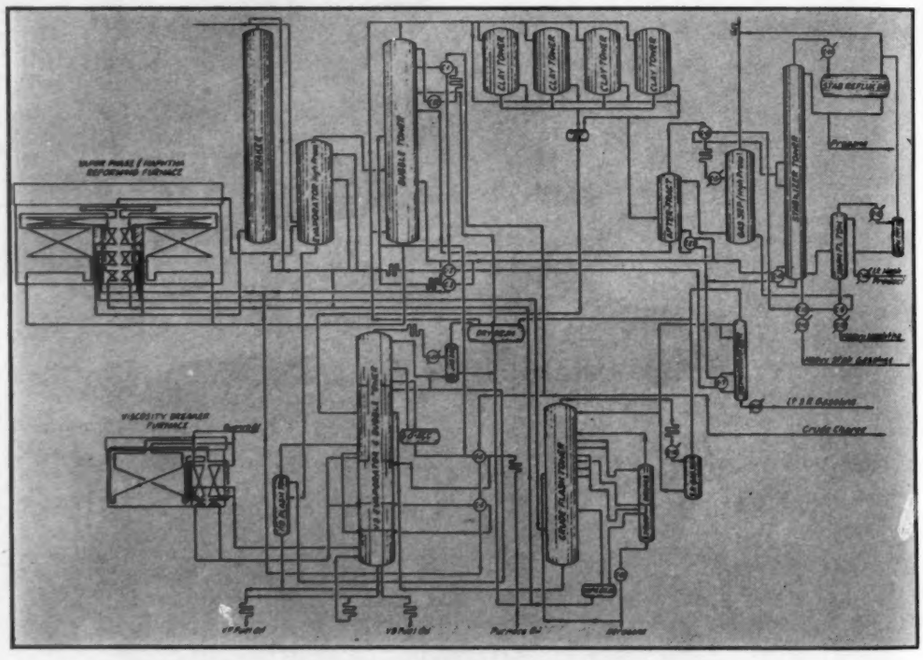


Fig. 1—Simplified flow diagram of a 30,000-bbl. capacity combination cracking unit operating on East Texas crude showing inter-connection between clay towers and cracking unit

(c) Color-stability tests:

1. Sunlight exposure is frequently used to test both sour and sweetened samples. Specification varies.

2. Color hold on dark storage is sometimes tested by direct or accelerated methods.

(d) Copper-dish gum: This is the test most frequently used for control specification on cracked gasoline, the limiting value ranging from 10 to 40 milligrams.

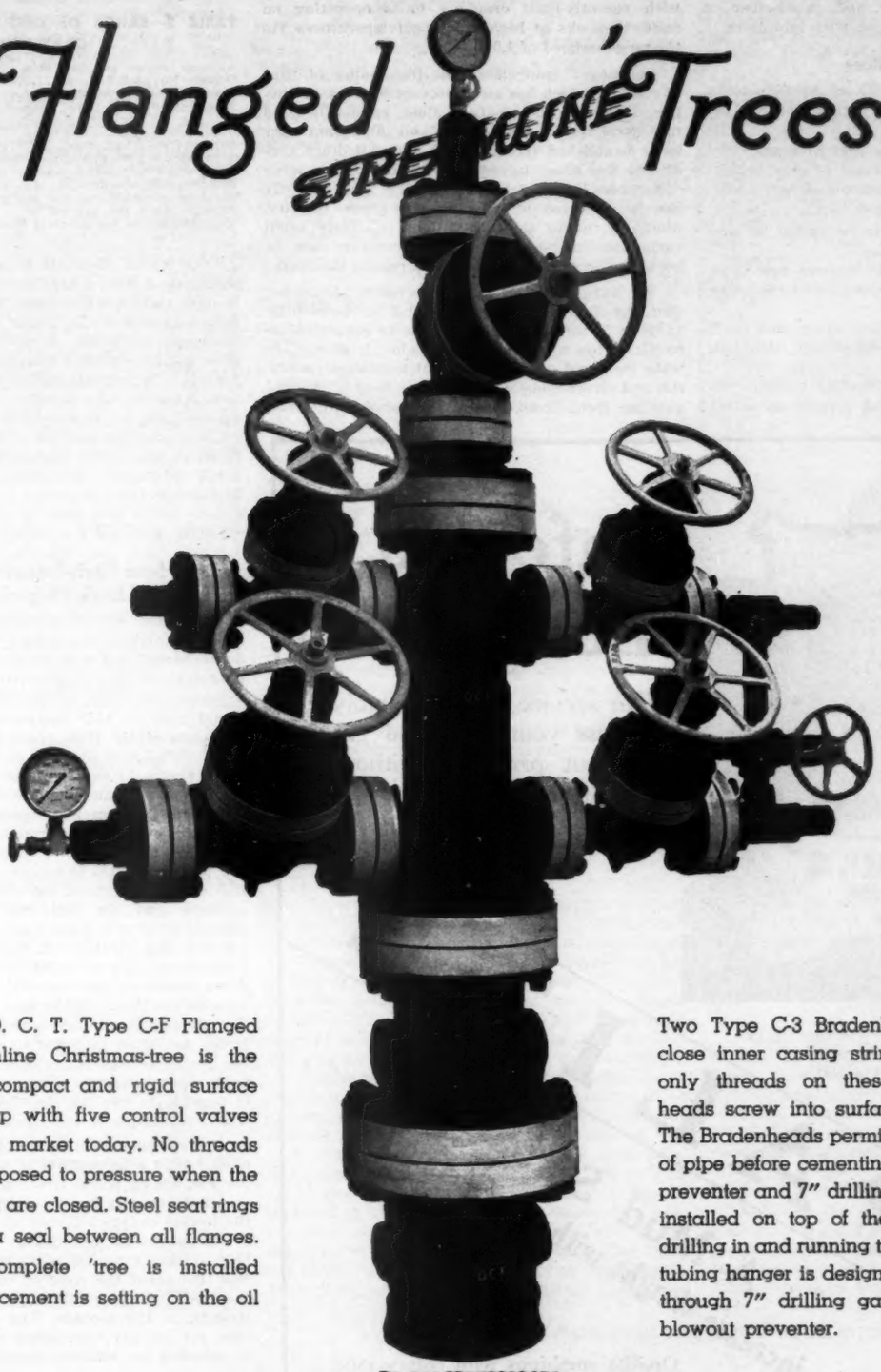
(e) A.S.T.M. or other air-jet gums: Tests of this nature are seldom applied for control purposes, and then only for vapor-phase cracked gasolines and others having comparatively high gum content.

(f) Induction period: Voorhees and Eisinger[8] method or bomb method sometimes used for control. Specification varies over wide range.

The control tests are performed on the cracked gasoline alone, or on the final blend of cracked

[1a] Figures refer to bibliography.

Flanged Streamline Trees



The O. C. T. Type C-F Flanged Streamline Christmas-tree is the most compact and rigid surface hook-up with five control valves on the market today. No threads are exposed to pressure when the valves are closed. Steel seat rings form a seal between all flanges. The complete 'tree is installed while cement is setting on the oil string.

Two Type C-3 Bradenheads inclose inner casing strings. The only threads on these Bradenheads screw into surface casing. The Bradenheads permit swinging of pipe before cementing. Blowout preventer and 7" drilling gate are installed on top of the 'tree for drilling in and running tubing. The tubing hanger is designed to pass through 7" drilling gate and 7" blowout preventer.

Patent No. 2016454

We Make Everything for the Christmas-tree But the Valves, Which You Specify.

and straightrun gasolines. The tests performed and the criteria applied depend on the marketing practice of the individual refiner, and on whether or not he supplements clay treating with inhibitors.

Design Factors

(a) Ratio between quantity of gasoline to be treated and amount of clay (barrels per ton per hour).

(b) Treating temperature and pressure.

(c) Number and arrangement of clay beds.

(d) Ratio of depth to diameter of clay beds.

(e) Type of adsorbent used.

(f) Recirculation or nonrecirculation of part of treated gasoline through clay.

(g) Difference in endpoint between raw product entering clay tower and vapors leaving polymer bubble tower.

(h) Time of contact [depends on (a) and (b)].

(i) Vapor velocity [depends on (a), (b), (d), and (f)].

Large differences in clay-treating temperature and pressure have been found greatly to affect clay life. This has made it possible to obtain the long clay life and efficiency of treatment observed with recently-built cracking units operating on residual stocks at high cracking temperatures (in the neighborhood of 1,000° F.).

Steininger[9] emphasized the importance of time of contact, which has an important bearing on clay life. However, this feature alone cannot be said to control results. Laboratory and pilot-plant runs have established the fact that with all other conditions the same, including time of contact, large differences in operating efficiency and economy can be obtained by varying the vapor velocity. Similarly, under some conditions relatively small variations in temperature and pressure are of great importance as measured by results obtained.

We have indicated by the foregoing discussion that the flux of interrelated and independently-varying factors makes it difficult to generalize as to Gray tower performance. Table 2 shows the wide range of commercial results obtained on rerun and direct-connected Gray treatment of cracked gasoline from Cross, Dubbs, Holmes-Manley, Tank and Tube, Gyro, combination, and other cracking units.

TABLE 2—RANGE OF OPERATING CONDITION OF GRAY TOWERS

Amount treated per day, bbls.	80 to 12,000
Octane No., A.S.T.M.	55 to 80+
Number of Gray towers	1 to 6
Arrangement	Single, parallel, series
Diameter of towers, feet	5 to 25
Depth of clay bed, feet	6 to 25
Gasoline per ton of clay per hour, bbls.	0.5 to 6.1
Time of contact, sec.	20 to 400
Treating temperature, °F.	250 to 475
Treating pressure, lbs. per sq. in.	5 to 380
Pressure drop, lbs. per sq. in.	2 to 50
Throughput per ton of clay, bbls.	800 to 27,000

The lowest yield per ton of clay indicated was experienced with a highly-cracked gasoline refined to meet rigid specifications. The high yield was obtained in one of the plants described hereinafter. Both are extremes. A normally-cracked product from a representative charging stock should be expected, in a properly-designed Gray-tower installation, operating at a pressure of 40 to 60 pounds per square inch, to treat a minimum of 2,000 bbls. of cracked gasoline per ton of fullers earth to specifications which will enable the product to be marketed unblended, uninhibited, and undyed. Where higher operating pressures (150 to 200 pounds per square inch) are used, a corresponding clay life of 4,000 bbls. per ton may be expected.

Data from High-Pressure Gray Treating at High Throughput Rate

Price and Brandt described[10] in a general way the clay-treating installation in connection with a 30,000-barrel per day combination cracking unit operating on East Texas crude, and presented an extended discussion of the results obtained. Additional runs on this equipment show results that are even better than those given in that paper. A simplified flow diagram of the complete installation (Figure 1) shows the interconnection between the clay towers and the cracking plant. The installation in question is noteworthy because of the combination of high throughput per ton of clay and high treating rate, expressed in barrels per ton per hour. This is accounted for by a combination of circumstances, including high clay-treating pressure and the fact that, although only the cracked product is passed through the clay towers, cracked and straightrun gasoline from the combination unit are ordinarily routed to the same run-down tanks—so that the critical properties are the tests on the blend, rather than on the cracked gasoline alone. Still another cause for the long clay life is the use of an inhibitor to supplement the treating action of the clay. This minimizes induction period as a criterion of clay efficiency, and makes it possible to use the clay for longer cycles than would otherwise be the case.

Table 3 summarizes a recent run which was concluded after a throughput of more than 27,000 bbls. per ton, during which treating conditions were substantially those given by Price and Brandt. Since the towers charge 105 tons of clay, this represents a throughput on one charge of clay of 2,800,000 bbls. during a period of more than nine months. For this plant the time of contact, calculated on the basis of the perfect gas laws by Price and Brandt, is 110 seconds. The treating rate is 4.8 bbls. per ton per hour when the combination unit is operated for ultimate gasoline production.

The data given in this table, and plotted in Figure 2, represents average conditions for each 1,000 bbls. per ton throughput. Since the cracked gasoline from this unit is ordinarily blended in the run-down tanks with varying amounts of straightrun, most of the available information is on the properties of the blend. The color of the cracked gasoline is, however, recorded as an index of clay activity. Figure 3 shows the variations (during the latter part of the run) in percentage of straightrun, endpoint of cracked gasoline, induction period, and gum. The extreme fluctuations are caused by the changes in endpoint and percentage of the cracked gasoline. During parts of this period the straightrun concentration was zero, and corresponding tests on the cracked product can be read from the graphs.

We have already referred to the fact that clay-treated gasoline is especially responsive to inhibitors. Table 4 shows the octane number, inhibitor response, and other tests of cracked gasoline from

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the same plant before and after clay treating. These samples were redistilled in order to obtain conformity of distillation range. Note the fact that, even at the high clay life already reached, induction period of the cracked gasoline is more than

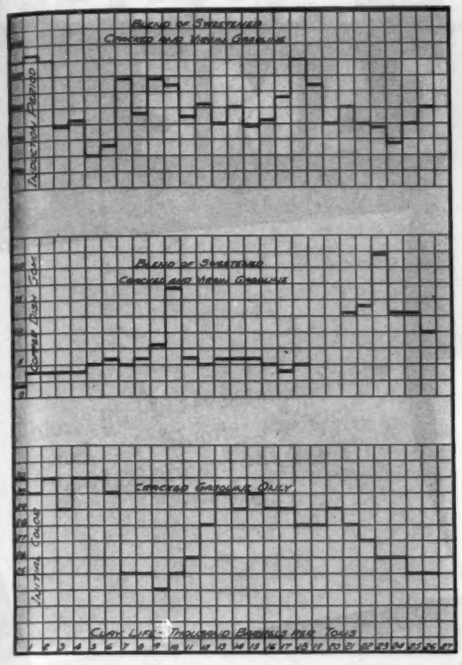
Blend of Sweetened Cracked and Virgin Gasoline
Induction Period
Blend of Sweetened Cracked and Virgin Gasoline
Sunset Assay Color
Cracked Gasoline Daily
Actual Color
Clay Life: Thousand Gallons per Ton

Fig. 2—Plot showing gasoline improvement resulting from clay treating

doubled by clay treating, and the b.a.p. response is also almost doubled.

TABLE 3—AVERAGE PROPERTIES OF GASOLINE VS. CLAY LIFE

(Gray towers connected to 30,000-bbl. per day combination unit)

Clay life	Cracked Gasoline	Blend of cracked and virgin gasoline to run-down tanks				
		Color		Induction period*		Copper-Dish Gum
(Bbls. per ton)	Color	Sour	Sweet	Sour	Sweet	Sweet
0- 1,000	30+	30+	30	500	375	2
1,000- 2,000	30	29+	30+	695	385	4
2,000- 3,000	30+	30+	30+	535	375	4
3,000- 4,000	29+	30+	30+	520	270	4
4,000- 5,000	30+	30+	30	430	280	4
5,000- 6,000	30+	30+	30+	295	225	5
6,000- 7,000	30	30+	30+	455	240	6
7,000- 8,000	25+	26	25+	395	345	5
8,000- 9,000	25	27	27	355	290	6
9,000-10,000	24	25	25+	545	345	8
10,000-11,000	25+	26	25+	...	335	17
11,000-12,000	26+	26+	26+	350	285	6
12,000-13,000	28+	28+	28+	405	305	5
13,000-14,000	30	28+	27	...	275	6
14,000-15,000	29+	29+	27+	...	300	6
15,000-16,000	30	30+	30	...	270	6
16,000-17,000	29+	30	29+	...	280	5
17,000-18,000	29	29+	29	...	315	4
18,000-19,000	28+	28+	28+	490	375	5
19,000-20,000	28+	....	....	...	335	..
20,000-21,000	29	....	....	...	275	..
21,000-22,000	28	....	....	...	300	13
22,000-23,000	27	....	....	...	275	14
23,000-24,000	26+	....	....	...	270	22
24,000-25,000	26+	....	....	...	245	13
25,000-26,000	25	....	....	...	275	12
26,000-27,000	25+	....	....	...	300	10

*Voorhees and Elsinger method.

Data from High-Pressure Gray Treating at Low Throughput Rate

In comparison with the above plant may be taken one running at conditions tending to produce a more highly refined cracked gasoline. This plant has two Gray towers, each 6 feet in diameter with a 28-foot clay bed, and a clay charge of 16 tons for each tower. The towers here are arranged in series, followed by a polymer fractionator, and operating conditions as given in Table 5 obtain.

Note that in this case reflux material for the main bubble tower is obtained from the gasoline receiver. As pointed out by Steininger, this does not change the effective contact time. It does, however, increase the vapor velocity. Steam is used at intervals to increase the activity of the clay.

TABLE 4—GASOLINE IMPROVEMENT RESULTING FROM CLAY TREATING

Clay life, bbls. per ton 23,600

Sample	Inlet	Outlet
Gravity, °A.P.I.	56.0	56.3
A.S.T.M. distillation in °F.		
Initial boiling point	106	104
10 per cent point	162	158
50 per cent point	266	266
90 per cent point	344	344
Endpoint	380	379
Octane No., C.F.R. motor method	68.1	68.0
Copper-dish gum, milligrams	103	26
Induction period, min.	145	330
Induction period of sample plus 0.001 per cent b.a.p.	235	680
B.a.p. response per 0.001 per cent, min.	190	350

TABLE 5—OPERATING CONDITIONS

Charge to cracking unit	28-deg. reduced Kentucky crude
Transfer temperature, °F.	965 to 970
Octane No. of cracked gasoline, A.S.T.M.	70
Distillate entering, bbls. per day	1,365
Distillate returned as reflux, bbls. per day	440
Net make, bbls. per day	925
Operating pressure (inlet), lbs. per sq. in.	175
Operating temperature, °F.	430
Bbls. per ton per hour	1 2
Time of contact, sec.	258

Table 6 shows the results obtained through one complete clay cycle, covering approximately 11 months. All results shown are on sweetened samples. The "sun-color" test is made by exposing 450 ml. of the sample to 16 hours of bright sunlight in a clear-glass, round, pint bottle. The bottle is stoppered with a cork stopper that has a one-sixteenth inch deep V-groove cut in its side over its entire length. A beaker is inverted over the bottle neck to prohibit the entrance of moisture and dirt. During the test the bottle is placed on a wooden platform, painted white. Note especially the uniformity of the color and gum test, as well as the stability on storage. The tests would indicate that the clay was still far from being spent at the end of the run. It was, however, removed to allow inspection of the apparatus.

In view of the long contract time, coupled with a low rate as expressed in barrels per ton per hour, it is of interest to note that the amount of polymerization at the plant just discussed is not excessive. A check over an extended period showed that polymer-containing material drained from the unit at rates varying from 35 gallons to 113 gallons per hour, and ranged in gravity from 34 to 41 degrees A.P.I. Total daily production was 27 bbls. of which 72 per cent was naphtha boiling within the range of the gasoline being produced. This left a true polymer production of approximately 1.15 per cent, based on the refined cracked gasoline. This figure is not out of line with results from other plants, which show polymer production as low as 0.5 per cent and as high as 1.5 per cent of the gasoline treated. It should be noted in this connection that, where clay towers have been installed in connection with cracking units which had been run for some time without them, there has been no evidence of decreased throughput or of decreased gasoline production upon the use of the Gray equipment—so that net polymer degradation is certainly below the error of magnitude of measurement of gasoline production. This is accounted for in part by re-cycling polymers to the cracking plant, and probably in

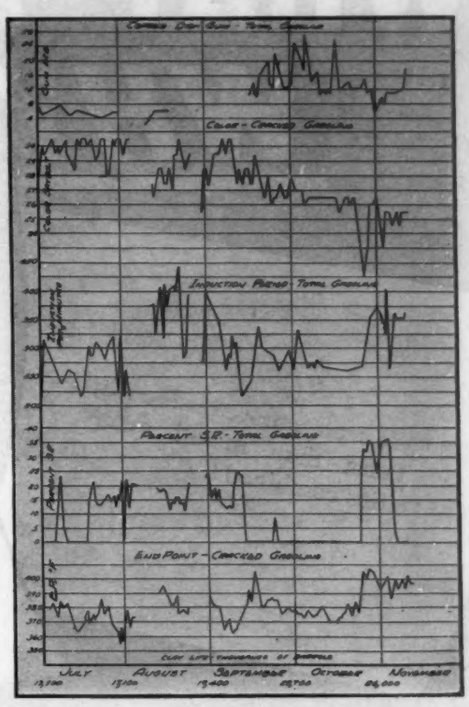

Fig. 3—Variations, during the latter part of the run, in percentage of straightrun, end-point of cracked gasoline, induction period and gum

to gasoline by catalytic action of the earth. It is understood that some plants have found a market for their polymers—which, in view of their many interesting properties, is not surprising.

Clay Treating Kettleman Hills Cracked Gasoline

Before leaving the subject of clay treating cracked gasoline, reference should be made to a recent installation treating gasoline from topped Kettlman Hills crude. Two Gray towers are used, in series, each charging 7½ tons of clay and followed by a polymer separating tower. Table 7 shows operating conditions and reported results.

Clay Treating Polymer Gasoline

Although the discussion up to this point has concerned cracked gasoline, and the bulk of commercial clay treating has been with cracked gasoline, this treatment is applicable to other motor-fuel products as well. A notable instance is motor

TABLE 6—DATA FROM UNIT OPERATING AS IN TABLE 5

Total throughput (barrels per ton of clay)	Dark storage colors (Saybolt)				"Sun color"	Gum—dark storage (copper-dish)				No. times clay steamed	Throughput since steaming (bbls.)
	Initial	30 days	60 days	90 days		Initial	30 days	60 days	90 days		
186	+30	+30	+30	+30	22	1.2	6.0	9.2	3.5	0	...
292	+30	+30	+30	+30	21	7.4	10.9	2.8	13.1	0	...
362	+30	+30	+30	+30	11	3.0	1.7	0.0	1.3	0	...
458	+30	+30	+30	+30	26	0.1	0.2	1.2	1.1	1	85
606	+30	+30	+30	+30	23	1.1	4.1	2.5	7.2	1	232
825	+30	+30	+30	+30	22	2.3	0.8	1.1	0 6	1	451
983	+30	+30	+30	+30	23	0.7	1.7	6.1	2.7	1	610
1,082	+30	+30	+30	+30	18	2.7	6.1	6 6	7.1	2	90
1,228	+30	+30	+30	+30	18	10.9	18.9	7.9	4.5	2	235
1,256	+30	+30	+30	+30	16	3.2	4.9	4.7	5.5	2	264
1,477	+30	+30	+30	+30	25	3 6	3.2	2.0	1.6	3	184
1,629	+30	+30	+30	+30	23	4.6	7.7	0.2	0.7	3	236
1,857	+30	+30	+30	+30	22	24.3	12.1	2.2	2.2	3	464
1,962	+30	+30	+30	+30	18	3.2	0.3	7.2	0.4	4	51
2,100	+30	+30	+30	+30	22	9.8	9.2	4.7	1 3	4	188
2,285	+30	+30	+30	+30	25	11.9	11.9	8.8	10.1	4	373
2,415	+30	+29	+30	+30	22	16.5	14.5	1.4	5.1	4	503
2,609	+30	+30	+30	+30	25	4.1	1.3	2.6	4.0	4	697
2,773	+30	+29	+29	+29	25	5.5	12.5	8.8	5.3	4	889
2,958	+30	+30	+30	+30	25	1 5	3.5	2.8	3.0	5	185
3,300	+30	+30	+30	+30	25	4.2	3.1	2.7	10.1	5	527
3,517	+30	+30	+30	+30	15	9.8	10.6	10.4	10.6	5	840
3,794	+30	+30	+30	+30	22	1.6	1.2	5.1	1.0	6	121
3,918	+30	+30	+30	+29	21	5.2	5.4	9.7	6.1	6	246
3,933	+30	+29	+29	+29	23	6.0	4.5	4.2	4.1	6	260
4,059	+30	+30	+30	+30	20	3.1	8.9	12.0	6.2	6	386
4,315	+30	+30	+30	+29	15	10.0	7.3	7.3	10.2	6	643

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Air-Maze Corp.,—Sales offices
H. W. Marker & Co.,—Manufacturing agency
Fred E. Cooper Co.,—Manufacturing plant and warehouse
Jones & Laughlin Steel Co.,—District representative
Buffalo Gas Engine Co.,—Sales office
Rector Well Equipment Co.,—Sales office
Wilson Supply Co.,—Sales office
C. W. Cotton Co.,—Sales office and warehouse
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The Tank Corporation,—Steel tank construction
Le Roi Motors Co.,—Sales office and service warehouse
Mountain Iron & Supply Co.,—Sales offices
Milwaukee Pump & Tank Co.,—Secured representative
Sullivan Machinery Co.,—Engineering sales office
A. Wallach,—Sales offices
United Supply & Mfg. Co.,—Sales offices and warehouse
Brammer Machine & Tool Service Co.,—Engineering sales office
Excelite Company,—Insulation mfg. plant
McNamar Boiler & Tank Co.,—Tank mfg. plant
Central Steel Co.,—Tank mfg. plant
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fuel produced from gases by polymerization. Here the material to be treated is high in octane value, and a process which can refine it with minimum loss and full retention of anti-knock properties is, of course, to be favored. Both the Osterstrom and the Gray processes are being used for this purpose. In the applications of the former, and in some of the latter, the polymerized gasoline is blended with cracked products before being clay-treated. In at least one plant, however, a separate Gray-tower installation is used, and results on polymer gasoline are available. The polymerization unit, of the thermal type, has already been described.[11] Operating results are abstracted in Table 8.

TABLE 7—OPERATING CONDITIONS AND REPORTED RESULTS

Charge to cracking unit	22-deg. API topped Kettleman Hills crude
Amount of gasoline, bbls. per day	427
Clay-treating pressure, lbs. per sq. in.	40
Clay-treating temperature, deg. F.	350
Endpoint of gasoline, deg. F.	400
Octane No. of gasoline, ASTM	68 5
Throughput, bbl. per ton	2,500+
Gum (copper-dish), milligrams	8
Color	30+

TABLE 8—CLAY TREATMENT OF POLYMER GASOLINE

Size of tower, feet	10 x 40
Clay capacity, tons	18
Gasoline, bbls. per day (gross)	1,100
Gasoline, bbls. per day (net make)	700
Clay-treating temperature, deg. F.	330
Clay-treating pressure, lbs. per sq. in.	25
Color before clay tower	dark straw
Color after clay tower	dark straw
Color after polymer separator	27
Gum (copper-dish), Milligrams	20 to 40
Induction period,* min.	120
Induction period plus 1 lb. b.a.p. per 100 bbls., min.	240+
Octane No., ASTM	79
Clay life, bbls. per ton	20,000

*Bomb method.

In addition to the applications of clay treating to cracked and polymerized motor fuel, laboratory and pilot-plant investigation has shown that it is adapted to the refining of motor benzol. However, no commercial installations have yet been made.

Costs

It is difficult to generalize concerning the cost of clay treating. Major operating items are capital costs, due to the installation, and cost of clay. Those in turn vary with the conditions. Gray-tower installation costs depend on the size and number of towers, working pressure, refinery requirements as to construction, etc. Some installations, made from existing vessels at low cost, have run as low as $12 per-barrel-per-day capacity. Some, where complete engineering was necessary, have cost more than $30 per barrel per day. Most installations which have been made are in the $15-$25 per-barrel-per-day range. Based on long experience of one refiner, all direct operating costs—including clay, clay handling, steam, etc.—aggregated less than $0.01 per barrel at 2,000-bbl.-per-ton throughput—a clay life well below what most plants are obtaining. Assuming a cost of $20 per barrel capacity for the installation, and a 20 per cent per annum write-off, the following figures are obtained (omitting license fees):

	Per barrel
Installation	$0.011
Operating costs	0.01
Repairs and maintenance	0.002
Total	$0.023

These figures are conservative. Clay costs are frequently less than one-half cent per barrel. The repair item set up is liberal. Sweetening costs are not included; since they are inherent, whatever the refining method, when a doctor-sweet product is required. Any method applicable to sweetening cracked products may be used. Doctor treating, in the conventional manner, was almost universally relied on until quite recently; but in the past few years modifications of this method and others, such as those utilizing copper chloride, have been used with considerable success.

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Canadian Western Operations

LETHBRIDGE, Alberta, May 9.—P. D. Mellon, general manager and chief engineer of the Canadian Western Natural Gas, Light, Heat & Power Co. of Calgary, has announced testing of southern Alberta structures for new gas reserves will be the chief feature of the company's 1936 summer program. The parent company, International Utilities, is jointly interested with Imperial Oil, Ltd., and Calgary & Edmonton Corp. in a deep test on the Cayley dome, 6 miles west of High River. The company will also drill a new well at Brooks, Alberta, to augment the gas supply for that town. Drilling contract has been awarded and rig is being moved from the Bow Island field. The company will carry on its usual replacement renovation work, and in Lethbridge extensive improvements to the distributing system will be undertaken.

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Controlled Disposal of Wastes Vs. Pollution

By W. B. HART
Atlantic Refining Co., Philadelphia, Pa.

"Controlled disposal of wastes vs. pollution" is a phrase that aptly fits a situation confronting many sections of the country. This situation has been growing in importance for many years, but recently has taken on particular interest because of its relation to other problems involving natural resources—such as soil-erosion control, reforestation, and flood control.

Whereas flood control has to do with establishing uniformity of the quantity of water flowing into our streams, "waste disposal vs. pollution" is concerned with the quality of our water resources.

Natural lake and stream waters, subject to natural conditions only, contain widely varying quantities of organic and inorganic material in suspension and in solution. This has always been so. Yet these waters have utilitarian value. In some cases they are safe for drinking—the highest value in water use. But today no one, except in rare cases, can drink from a spring or stream without fear of water-borne disease. In other words, one would fear that some contamination had destroyed this particular utilitarian value. From this we can develop a definition for both sides of the situation: "controlled waste disposal vs. pollution." Where the utilitarian value is not destroyed even in using the drainage value of our streams, we have the picture of controlled waste disposal. Where wastes are indiscriminately dumped into lakes and streams, beyond the ability of these waters to handle them, the utilitarian values are destroyed, or made difficult and expensive to recover. Such is pollution in the problem of today.

How Pollution Starts

Let us expand this comparison for clearer understanding. A depression in the earth's surface, similar to a gulley, ranges down from the higher country to the sea. Some water is flowing down the course of this depression, and other similar water courses join it along the way. All this is of no consequence.

Now let us put some grass, brush, and trees along the stream, and a good road beside it. Soon motorists are using the road and enjoying the scenery. Put some fish into the stream, and more motorists drive out to catch them. These things are important, but not essential.

Now let us put a farm on the banks of this stream, a truly agricultural enterprise. On the opposite bank let us put a stock farm. Both of these endeavors are possible because of the stream. It supplies water for the farmers, the crops, and the stock. True, the wastes from these farms are drained to the stream, but natural processes within the water soon render these wastes innocuous. Here, too, the stream is useful. It drains the district.

To this attractive region an industry moves, and with it comes population—as operators and their families. This industry and village enjoy all the benefits of pure water. They prosper. Our stream has taken on new importance. Not because it is a stream, but because it continues to supply good water and continues to digest and carry off the wastes. But it requires more run of stream to do this, and also some preparation of its waters before use. Yet, on the whole, the community is a thriving one, and its advantages become a by-word.

More industries and more people become established along the stream; and eventually, either as a result of epidemic or interference with industrial processes, it is realized that its waters no longer have their original value. It cannot supply the domestic water needs of the community; it makes the cattle sick; it discolors and kills vegetation and the trees along its banks, and must be treated by expensive processes for use in manufactures or in boilers. Pollution has arrived. The farmers move away; the scenic effect of the region is lost, and motorists no longer use the road as a drive or come out to fish. Recreational uses of the water are not safe, and pleasure or commercial fishing is ended. There is left only industrial use of the water (at a cost) and navigation. For domestic supply, the people have a choice of paying for expensive treatment or expensive installations to bring water from a distance.

Now, following this history just a little further, let us watch the banks of the stream as the vegetation and trees are killed. With each rain storm gulleys form, and soil and silt are washed into the stream bed. It becomes shallow, and shoals form. Navigation can only be continued by the expense of dredging. At times of heavy storm, run-off from denuded areas becomes greater, and the shallow stream bed will not carry the water. The result is flood, with the accompanying damage to property and possible loss of life.

This is pollution. It is aided by other natural forces, but in itself it is a major contributor—all because of a lack of foresight, even when the conditions in early stages of the situation pointed the way. By control of waste disposal, the dire picture just described could have been prevented, in large measure, if not entirely.

***A.P.I.*—Presented Mid-Year meeting of American Petroleum Institute, Tulsa, May 14, 1936.**

Controlled Waste Disposal

Let us examine this idea of controlled waste disposal to see what it means. To do so we can use the stream just described and follow its history, starting with the advent of industry and population.

Our first assumption will be that there is a definite will to protect this stream, not necessarily for the sake of the stream, but because of its values that can be harnessed and made use of, similar in idea to making use of water power. To do this the stream must be studied, its flow determined—maximum, minimum, and average; its water analyzed to learn its nature and its capacity to assimilate wastes. With these data at hand, the wastes of the community—both domestic and industrial—are next studied, and the demand upon the stream that each will make established.

Without going into further detail, the demand for disposal will be set up against the capacity of the stream to handle it, and a balance struck to show just how much assistance will be required by the stream in carrying out its drainage function. The disposal of all wastes would be handled through predetermined treatment processes to keep within this limit. Therein lies the control. It does not mean the conditioning of all wastes to the purity of potable water. It means only helping the stream to do what it will always do if given a chance. Natural laws will work just as effectively for us as they will against us. It is only a matter of condition in the stream as to which way they turn.

With the wastes of the community controlled in quality or quantity before disposal, the farms of our pictured region will continue to prosper; the motorists will continue to enjoy the scenery along the road, and may stop to catch fish; the mills and community will have a good water supply; and the people, in their increasing leisure hours, will have recreation almost at their door. There will not be the pristine purity of the days prior to the coming of the first farm. There will be some change in condition. But by far the major part of every item of stream resource value will be retained even at some cost in money—this in comparison with cost and no resource value where pollution has taken control.

The Economic Problem

Again returning to our original phrase: "controlled disposal of wastes vs. pollution," it is worthy of examination in another light. What does "controlled disposal" cost, and what does pollution cost?

Going back 25 or 30 years, who would set up a money value on the waterway resources of the nation? They were of almost inestimable value. Consider the earnings they have made possible in that length of time. Those earnings are rapidly being reduced by the cost of handling polluted water, until today our water resource value (though still great) is shrinking rapidly. It costs too much to recover.

No real estimate of the cost of pollution has ever been attempted. An approximate estimate can be made and—without going into the detail of treating water for various uses, installations for distant supply, cost of destroyed industry, corrosion, dredging of shoals, etc.—this estimate runs from $300,000,000 to $500,000,000 annually. This is an estimated figure, and is based on rather meager information; but even so, the final figures resulted even after downward revisions to assure conservatism.

Compare the figure with soil-erosion cost estimates. Water and wind-erosion each year are carrying 3,000,000,000 tons of soil beyond use. Already, 100,000,000 acres, equal to the area of Illinois, Ohio, Maryland and North Carolina, have been destroyed. Another 125,000,000 acres is seriously impaired, and another 100,000,000 acres of the finest agricultural land is menaced. The annual cost to the nation is estimated at $400,000,000. The accumulated cost so far is figured at $10,000,000,000. It is further estimated that if preventive measures are not taken, the cost will mount to $25,000,000,000 or $30,000,000,000 within the next 50 years.

Pollution and soil erision are comparable economic problems; and the ever-mounting cost of pollution, resulting from increase in population, industry, and the ravages of other natural forces, will rapidly become unbearable.

It may well be asked: "What can the control of waste disposal do for us?" This may be answered by saying that proper control will bring back, in large measure, the streams that have been ruined. It will also retain the resource value of those lakes and streams that have not lost this value. It will not restore the pristine purity of years ago. It will not cause salmon and shad to return to streams from which they have been driven. Other changes in other natural forces must take place before such things can be accomplished, and this is unlikely. Of most importance is the fact that all users of water will have that use at the least possible expense commensurate with other requirements for successful operation—and not the least of these requirements is public good will.

Users of water have learned much about preparing it for various types of consumption. With

At the beginning of this century welding was done by forging. The fusion of ferrous metals without anvil and hammer was unknown, and pipe line welding was impossible.

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the control of waste disposal, treatments would be required in much less degree. This would be the contribution of domestic and industrial waste disposal. The producers of wastes would treat them so that the available knowledge concerning the preparation of water for its various uses would be fully adequate and leave a safe margin. This would be the contribution of the users of water.

Refining and Pollution

In some sections of the country petroleum refining has been mentioned as one of the "four horsemen of pollution." This was several years ago. Since that time there has been considerable improvement. Also, since that time, the agitation by the champions of clean streams has increased many-fold. The subject is a popular one. It has political value, and much prestige will accrue to the individual who will bring about legislation that allegedly will solve the problem. This is evidenced by the fact that today 12 bills are printed and under consideration at Washington. If in each case these bills were companion bills, there would be six separate and distinct proposals. This is the greatest number, by far, that has ever been introduced at any one session of congress. Some would work untold hardships on industry; others are unworkable; and some merely call for investigation. Several theories of administration are involved. States' control vs. federal control is not the least important among these.

In any event, petroleum refining is vitally interested; for petroleum refining uses large quantities of water and must dispose of wastes. Has the petroleum industry as a whole had the foresight mentioned in connection with our previously-pictured stream? There is reason to believe that it has not. Some refineries have gone to considerable trouble to protect the quality of the waters into which their wastes are discharged. This has been the case in some instances when the water receiving the wastes has been already badly polluted; but the industry as a whole, large plants and small, has not had such foresight. As a rule, it has been only under threat from authorities that action has been taken. This has been true of other industries as well, and also of municipalities.

There are several reasons for this. Custom, for instance, is one reason. For years back people have used the streams to get rid of their wastes. They became used to doing so, and have continued to do so regardless of effect.

Then there has been ignorance of the effects of wastes on the waters receiving them. There are those who do not realize that these discharges are harmful to the water quality.

Also, there are those who realize that they are causing trouble but cannot help themselves, either from lack of funds or because there is no way known for handling the wastes and eliminating their noxious characteristics.

But there are those who know how to control their waste disposal—or at least could readily get the information—and who are not short of funds, who yet continue to destroy the resource values of streams either because, as they say, the other fellow hasn't done anything about it and if they did something, it would place them at a disadvantage; or because they just don't care how much they invade the rights of others.

Legislative Problems

Now let us examine these reasons, bearing in mind that they apply to all industry, and to towns and cities as well, and try to figure out whether we are ahead or behind in the game. Then let us narrow this down to the field of petroleum refining.

First, take the discharge of wastes in the light of its being the customary thing to do. It has been shown that there is no particularly serious result from this as long as the utilitarian values of the waters—the resource values, if you please—are not destroyed. But in a large percentage of our total waters some of these values have been destroyed, and it is costing the country a lot of money, and industry in particular a lot of good will. This also applies to those who are ignorant of the harm they are doing. Ignorance of the law is no excuse. Defiance of natural laws, either in ignorance or otherwise, gives you even

(Continued on Page 237)

The Dust Proofing of Compressor Stations

By R. T. POWERS
Texoma Natural Gas Co., Fritch, Tex.

The dust proofing of compressor stations has not been reduced to an exact science, nor is the necessity for dust proofing universal. It is a problem of great consequence in the operation of those compressor stations which are located in the Southwest, affecting at least six major natural gas pipe lines as well as much mechanical equipment in the oil and natural gasoline industries principally located in the vast Texas Panhandle oil and gas fields. This discussion can merely portray the adverse operating conditions which have been experienced, point out the observed effect of the dust on personnel and equipment, outline the protective measures which have been applied and suggest the ideal dust-protecting system.

Wind erosion has seriously damaged enormous portions of the 700,000,000 acres of the great plains region of the United States. Erosion by wind results in dust storms which darken the skies over many states. Erosion has been made possible by a deficiency of vegetation caused progressively by overgrazing first by cattle, then destructively in certain regions by sheep, followed by intensive and widespread conversion of grass lands to agriculture. An interval of drought began in the year 1929 which has continued almost unabated to the present time, a normal reduction of rainfall typical of the climatic cycles of this region and in the same year a huge area of sod was broken for the first time. Since that time large deficiencies of rainfall have accumulated and at the same time summer temperatures have risen, the soil becoming increasingly drier until reserves of subsoil moisture have disappeared. The general condition of increasing dryness has been followed in the early spring by unusual rainfall deficiencies, with the result that vast areas of soils which are susceptible to soil blowing have been in a particularly loose dry state with little or no protective covering of vegetation.

Two Types

Two types of dust storms have been observed, one in which the high winds blow the dust from the surface of the ground, the cloud of dust rising higher and higher, the other in which this dust having been carried into the upper strata of the air is borne along for a few miles or for hundreds of miles and then gradually settles back to the ground as the air velocities decline. It is understood that airplanes have passed through clouds of dust at altitudes of 15,000 feet above ground level. To explain the duration of some storms of the latter variety, it may be mentioned that a particle of dust 1 micron in diameter will settle at the rate of 5 inches per hour while a particle 10 microns in diameter will settle but 36 feet per hour.

The blown dust sampled from exterior window ledges, sidewalks and drifts ranges in particle size from 2 to 770 microns averaging about 80 microns. A micron is one-millionth of a meter. Chemical analyses show this dust to contain an average of 1.3 per cent moisture, 5.4 per cent organic matter, 78 per cent silica, 10.5 per cent metal oxides, 1 per cent calcium oxide and 3.8 per cent undetermined.

A sample of dust removed from the interior of corrugated galvanized iron covered compressor station building contained 1.5 per cent moisture, 4.5 per cent organic matter, 7 per cent metal oxides, 1.5 per cent calcium carbonate and 85.5 per cent silica. This dust was of flourlike consistency, however, no particle-size determination was made. This dust, when examined under a microscope, appeared to contain a large proportion of granular particles light in color and possessed of many sharp edges, an ideal abrasive.

In many fields around Dalhart, Tex., the U. S. Soil Erosion Service has found that 16 inches of soil and subsoil have been blown away in 18 months' time.

No athogenic organisms have been found in the dust which has been sampled, although bacteria numbering 850,000 per gram of dust have been observed. Molds are almost as numerous as bacteria and some yeasts were also observed.

The American Public Health Association has defined silicosis as—"A disease due to breathing air containing silica, characterized anatomically by generalized fibrotic changes and the development of miliary nodulation in both lungs and clinically by shortness of breath, decreased chest expansion, lessened capacity for work, absence of fever and increased susceptibility to tuberculosis." Silicosis is therefore a disease of the lungs in which normal tissue is replaced by scar tissue due to breathing air containing silica dust. A scarred lung is readily susceptible to infections that led to pneumonia, tuberculosis and bronchitis, and other ailments. Although silica chiefly affects the respiratory organs, it may also impair the circulatory system, the nervous system, the digestive organs and the kidney sand liver. It is said that the silica dust hazard is probably the most widespread and insidious hazard in the environment of mankind. It is generally agreed that particles of dust larger than 10 microns cannot gain access to the vital parts of the lungs.

***A.G.A.*—Presented before annual convention Natural Gas Department, American Gas Association, Dallas, May 5 to 8.**

The health of the residents of the "Dust Bowl" has beyond a doubt been adversely affected by the dust, although so far as is known, no illnesses positively identified as silicosis have been reported. The future effect of the dust is not known; however, the United States Public Health Service predicts that possibly over a long period of exposure or repetitions of the storms the end effects would be similar to those from exposure to mine and other industrial dusts which definitely cause silicosis. The United States Public Health Service has reported on health conditions in the State of Kansas for 1935, stating that the various health officers reported a very marked increase in acute respiratory infections, in sinusitis, laryngitis, pharyngitis and bronchitis. Unusually large numbers of streptococcic sore throat, of corneal ulcer and of eye infections were reported. The infant mortality in the wind soil erosion counties was 80.5 per 100,000 as compared with a rate of 62.3 for the state. Kansas reported more than 40,000 cases of measles in the period January 1 to June 8, 1935 inclusive as compared to the previous high total of 22,464 cases for the 12 months of 1917.

While the dust storms have been anything but conducive to good health, few of the operators at compressor stations affected by the dust storms have suffered serious illnesses. A few sufferers have quit their jobs while some others have been compelled to do so in order to protect the health of members of their families, particularly of the children. Some of the men sent their families to other states outside the region affected by the storms for the first four or five months of the year.

When the dust storms became most severe many of the men improvised masks of cloth which they kept moistened in order to exclude the dust. Some families followed the same procedure at night in order to be able to sleep.

Many companies have provided respiratory protective devices or dust masks for the protection of their employes. The simplest type of mask is a gauze or cheesecloth packing covering the nose and mouth. The most popular, and a more efficient type is usually called the pig-snout mask which is fitted to the face and employs filter mediums of paper, paper fiber, sponge, wool cloth or felt which are easily replaced. The area of respirator filters should be as large as possible so that too much exertion will not be necessitated in breathing. The masks should be light and durable and should fit well. Heavy devices are cumbersome and the wearer is prone to avoid using them while leaks in illfitting masks will interfere with their effectiveness.

It has been the policy of the industry to provide substantially constructed and comfortable dwellings for the various employes at the compressor stations. In general, these dwellings have double floors, plastered walls and ceilings and the exterior walls are sheathed and papered before the application of drop siding or weatherboarding. Windows and doors are weather stripped. A number of companies have applied semiplastic calking compound fillets around door and window casings inside and outside and at the junction of foundation walls and woodwork to additionally protect against the infiltration of dust-laden air. In spite of these precautions, dust-laden air enters this type of dwelling to a very considerable extent, covering window ledges and furniture and completely obliterating, on some occasions, the flowered patterns of rugs.

Decreasing Infiltration

Toward decreasing the infiltration of the dust into houses of this type, little has been done. Minute cracks have been sealed by means of adhesive tape, gummed paper, melted paraffin or heavy grease.

Some success has been realized by sealing the windows with translucent glasscloth, sealing the edges of the glasscloth with gummed tape. Since fresh air must enter a dwelling house in order to displace vitiated air as well as to provide for the operation of gas-burning heating and cooking appliances, it would appear that the only positive way to prevent the entrance of the dust would be to admit adequately filtered air to these dwellings by some mechanical means in such quantities as to create a positive air pressure inside the buildings to counteract the tendency of the dust-laden air to infiltrate through the most minute cracks. Comparatively speaking, however, the employe feels that the dwelling house which he occupies is dust free as contrasted to his place of work. Efforts should be directed primarily to improving conditions in the engine rooms and workshops although there is much room for improvement in the protection of the occupants of the dwelling houses.

Compressor station buildings in the dust region are of the type with which all are familiar. Frameworks are of steel with corrugated galvanized iron or corrugated asbestos covering with an abundance of steel sash and doors. Dust enters

a building of this type through the side and end laps of the covering, through the joints around the doors and windows, at the gable and eave flashing and at the ridges when a hard wind is blowing to an amazing extent even with all doors and windows closed. There have been numerous occasions when operators could barely see from one end of an engine to the other even with all available lights burning, and many operators can remember one or more occasions when they could do no more than grope uncertainly around the engines in an almost impenetrable darkness. On unnumbered occasions dust settled in a few hours to a depth of one-sixty-fourth inch to one-thirty-second inch over exposed portions of engines, on foundations and on floors. Due to breathing action the dust entered crank cases, mixing with the bearing oil, completely overloading oil filtering systems, mixing with the oil and being pumped to bearings with harmful effect. One station reported a 2-inch accumulation of mud in crankcases in a few days with a maximum of .104 inch wear on the babbitt of crosshead shoes in five days' time, the oil "feeling like grinding compound."

Bearings ran very hot, dust entered lubricating oil supply tanks, oil measures, grease cans and lubricators unless very careful precautions were observed. Valve motions, cams and cam rollers wore to an unusual degree. The windings of open type electric generators and motors became completely clogged with dirt. In as much as the cooling of this equipment depends largely on the circulation of air, this dirt accumulation is likely to cause trouble unless promptly cleaned out. In exposed locations the totally enclosed motor should be used.

Practically all companies have fastened well-fitting canvas covers over the tail guides and openings in the intermediate crosshead guides of the engines and these covers have proven reasonably effective although a tendency to vibrate and "breathe" allows some dust to enter the guides. Furthermore, the use of these covers complicate routine inspections.

In an endeavor to limit the entrance of dust-laden air to the compressor station buildings efforts have so far been directed toward the sealing of many cracks or joints in the building coverings. Some companies have sealed the various lap joints in the corrugated covering, the joints between the covering and the door and window frames and the joints between the flashing and the covering by the use of one or more of the various available plastic calking compounds. Another method has been to solder the longitudinal joints in the corrugated iron, and fill all other joints with strips of oiled felt. The larger spaces have been filled with asbestos fiber moistened with oil and sealed over with the plastic calking compound. No attempt has been made, so far as is known, to weatherstrip the steel doors and ventilating sash. These measures have resulted in perhaps a very slight diminution of dust infiltration but here as in the dwelling houses air must be admitted due to the necessity for supplying ventilation. Natural ventilation is induced by the difference in air density due to the difference in temperature between the column of air inside the building and that of the outside atmosphere. Where air enters, dust enters.

Suppose we could seal up all of the cracks in the building covering and apply 100 per cent efficient weatherstripping to the doors and windows, what have we accomplished? We have positively excluded the dust. We have also excluded all fresh air and we have violated all accepted principles of sanitation and safety.

The ideal dust-proofing system is one in which dust is excluded from, and fresh clean air in adequate amounts is admitted to the compressor station buildings. The only practical means for admitting clean air is through the use of blowers and some form of air filtration or air washing. Through the use of the blowers a slight excess of air pressure could be maintained inside the buildings, effectively preventing the infiltration of dust through the many minute cracks and door and window joints.

Externally, the dust storms damaged or destroyed paint, ruined automobiles and trucks in a single season, covered up lawns with layers of dust 1 inch to 3 inches deep, buried stored equipment, filled up gate and drip boxes, half submerged property line fences and seriously contaminated cooling water systems.

The atmospheric type cooling tower is an excellent dust catcher. In these towers the dust is converted to mud, filling the distributing troughs, accumulating in concrete basins to considerable depths and converting the water into a dark brown fluid. This cooling medium deposits vast quantities of mud in engine cooling jackets impairing cooling efficiencies and necessitating frequent cleaning. Wearing parts of water pumps are also seriously affected by the abrasive material carried in suspension in the water. Remedies for this contamination of cooling water are simple. Where fresh water supplies permit, continuous dumping of the muddy water and periodic cleaning of cooling tower basins and hot wells reduce the turbidity of the water gradually. The use of sand filters for the continuous clarification of a portion of the water circulated may be worthy of consideration where fresh water is costly or the supply is limited.

The use of some form of air filter for the cleaning of combustion air for gas engines is standard practice. No comments on air filters can be made except that in the most severe dust storms the air filters furnished infinitely better protection to combustion spaces of engines than was afforded to other engine parts, to other equipment and to personnel, provided these filters were properly serviced.

This discussion was prepared early in February, at which time, it appeared certain that 1936 is to witness a repetition of the severe dust storms of the preceding year. No longer should the gas companies defer action on dust proofing as an unnecessary step to combat a singularly unusual condition of short duration. The dust storms are here to stay. Perhaps in 10 years, perhaps in 20 years, the efforts of various agencies directed at soil conservation may show results. It is the opinion of this writer that the terracing and cross

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listing of cultivated fields to prevent soil blowing are futile. The barren fields must be provided with a vegetative cover of erosion resisting grasses. This will require many years.

Controlled Disposal of Wastes Versus Pollution

(Continued from Page 234)

less chance. Nature's court does not recognize technicalities.

Consider the reason designated as lack of funds —a reason that in some instances is sound, and in others not so sound. This reason has been weakened by investigations revealing many instances of unwise expenditures wrecking the financial position, particularly of municipalities. In the same way an examination of the plea that there is no known method for handling the particular waste may show that no particular effort has been put forth to find a method. In some instances, however, this plea is absolutely sound.

Now, both these reasons have been highly emphasized, and the result has been that legislation is proposed to correct the matter. Both present ways to spend money—a more or less national pastime. But the federal-loan-and-grant idea is tied in with a lot of other conditions that would not be so acceptable. The ultimate result has been that these reasons have been made an argument for federal control of the problem.

Let us now consider the reason most frequently advanced by industry for objecting to pollution-control legislation in various states. That reason is that, although they know what to do and have the funds to do it, the added burden would be a handicap in competition where competing plants were in different states. The logical conclusion from this is that the state is an inadequate unit for attack upon the problem. Those interested in pollution-control legislation did not miss this conclusion, and industry's own reasoning became the best weapon of its opponents for advancing legislation based on federal control. Without going into a discussion of states' rights vs. federal control, it can only be said that industry was put in a rather peculiar position in having to defend itself against attack with its own weapons.

Now let us look at the position of those who do not care, and see what they have contributed. Can you imagine what would be the effect on their sales if they were confined to a local market, and it was advertised in the local papers that they were ruining a water supply—or, at least, making it more expensive for the people in the community; or that they were ruining recreational facilities, etc.? That sort of advertising is going on every day. The particular plant or concern may be affected only slightly; for they may market very little locally. The advertising does not mention names either; and, as a result, the blame is saddled onto the entire industry—carrying with it the public ill will and an eagerness for any anti-pollution legislation, no matter how prohibitory.

The position of industry as a whole may be summed up by saying that it has made itself a lot of trouble; it has taught many things to those who, though sincere, lean toward the impractical and prohibitory; it is bearing the burden of blame for all pollution, since that from domestic sewage, although it constitutes possibly 75 per cent of the total, is not much advertised. Industry is the target of public ill will, and is gradually being driven into a corner by legislative schemes—one of which sooner or later will very likely become a law. Unless industry can stand up and demand a voice in creating the rules under which it must play, considerable cost and inconvenience may come to some—and some may come to all.

To be in this position industry must enter the field with clean hands, and to do this it must clean house. In this effort it must have leadership—someone who will make the start, who is well equipped with knowledge of what to do in controlling the disposal of its wastes. There are two very important reasons why the petroleum-refining industry is the logical one to take this position. It is a large user of water, and it has studied its wastes probably more completely than any other industry. For the past six or seven years the American Petroleum Institute Committee on Disposal of Refinery Wastes has been hard at work on the subject, and has published adequate procedures. They are not simple panaceas; some judgment is necessary in their application.

There are probably three or four major wastes to consider. They are waste oils and emulsions, waste caustics, acid waters, and acid sludges. If the disposal of these four wastes is well controlled, any stream receiving the resultant waste water will have ample opportunity to retain all its value. In most cases the cost of such control will be surprisingly small; particularly will this be a a surprise to those who have not bothered to look into the subject.

There will be a return on the investment as well. In some cases this will be in actual saving of materials or recovery of useful by-products. There will be the return from greater efficiency from a well-kept house but, most of all, there will be the value of public good will and the effect on other industries. Anticipated resentment will not materialize. There is too much to be gained by going along with the leader. The greatest voice in rule-making will go to him who makes the greatest effort at following the rules. It is bound to, for he will have the most experience and will be listened to. And in the end there is the saving to the nation of the cost of water pollution. All that is required is the will to make the start. That particular commodity can only come from within the individual elements of the industry.

The old cry of "catfish or commerce" is costing us money. It must be changed to "catfish and commerce," either by ourselves or by those who will not look upon our problems with the same sympathy. The law of averages has been well established. Undesirable legislation has failed of enactment on several occasions, but we should bear in mind that playing a fiddle did not stop the burning of Rome.

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Methods of Expressing the Volatility of Motor Gasolines

By W. W. SCHEUMANN
Empire Oil & Refining Co.

That satisfactory volatility should be considered the most important characteristic of motor gasolines is evident, from a practical observation, to anyone who has ever had to start a cold automobile motor on a sub-zero morning, or drive that same car in western Oklahoma on a typical July afternoon. Lacking the benefits of these practical observations, the same conclusions will be reached by even a casual perusal of the literature covering the relationship of automobile engine performance and motor fuel characteristics. Here is at least one case of complete agreement between the practical and the theoretical.

However, if the question concerning the definition of volatility is raised, or a satisfactory method for expressing such volatility requested, then all this complete harmony of thought disappears and we find not only various methods advocated for the expression of volatility, but we find that the concept of volatility itself varies widely and is often used in a misleading or incorrect manner.

Brown[1] states that motor fuel volatility may be defined as the degree to which a fuel will vaporize under specified equilibrium conditions. The Standard dictionary gives the following definitions:

1. Volatility, the state or quality of being volatile.

2. Volatile.

(a) Evaporating rapidly at ordinary temperatures on exposure to the air, as i.e. volatile oils.
(b) Capable of being vaporized.

3. Volatilise, to cause to pass off in vapor.

A consideration of these definitions would indicate that volatility as referred to motor fuels is a quality of the fuel which indicates its ability to vaporize, or the degree to which it will vaporize, at specified temperature conditions and ratios of air to fuel.

Early Concepts of Volatility

The first demonstration of a gasoline engine-powered vehicle is generally attributed to Elwood Haynes in 1894, at which time gasoline was simply a by-product of little value, produced chiefly from the distillation of Appalachian crudes. However, the automobile industry proved to be a lusty infant, and soon the increasing production of cars caused a simultaneous increase in the demand for gasoline, so that the by-product developed into the major product of the petroleum industry. During this time volatility and all other properties of gasoline as well were governed solely by density or Baume gravity. While various gradations were made, all petroleum distillates above 60 degrees Baume gravity were usually called gasoline or naphtha. This type of gasoline led to many difficulties, such as poor engine starting, smoking of exhaust, carbon deposition, lack of uniform performance, and there existed, therefore, almost universal agreement that a better method of quality control was necessary. The result was the development of the distillation test method. Many individuals and organizations too numerous to mention herein assisted in this development; however, by 1915 the American Society for Testing Materials had proposed a standardized method of test, and the first standardized specifications for gasolines were issued by the U. S. Fuel Administration in 1918, the apparatus and methods of test being published in U. S. Bureau of Mines Bulletin 166.[2]

The general adoption of this distillation test method did make possible the production of more uniform gasolines. However, there did not exist any background of facts relating the results of these tests and the volatility of the fuel in an engine, and many acrimonious discussions occurred as a result, regarding the relative importance of gravity or "initial" and "endpoint." Generally, it was assumed that the endpoint of a fuel represented or designated its volatility, and that the initial boiling point designated in some manner engine starting characteristics. Both of these ideas were subsequently proved to be incorrect.

Early Work on Fuel Volatility

By the early part of the 1920's the Engler distillation had become the subject of considerable attack from the technically minded regarding its suitability as the satisfactory means for the determination of gasoline volatility. This was largely due to the fact that it was recognized that the test is a batch affair, involving a certain amount of fractionation, that it completely neglected from 1 to 5 per cent of very light fractions which were lost during the test, that because as distillation proceeded the character of the residue in the flask became increasingly different from anything produced under engine conditions, and because the endpoint of the distillation is nearly 300° F. higher than the temperature of complete vaporization in the engine manifold.

N.G.A.A.—Greater recognition of the need for a single figure to express motor fuel volatility is becoming apparent and here the author reviews the methods used for expressing volatility and presented his views before the Natural Gasoline Association of America held in Tulsa, May 13-15.

As a result of this variation of ideas, research on the question of fuel volatility was not only greatly stimulated in the various larger laboratories of the petroleum and automotive industries, but resulted in the formation of, in 1922, the Co-operative Fuel Research Steering Committee, representing both of these groups and the National Bureau of Standards. One of the first undertakings of this organization was a study of the effect of fuel volatility on engine performance. Similar work was also done by other agencies, notably the Natural Gasoline Association of America, whose research program on motor fuels was carried out by Dr. George G. Brown at the University of Michigan. As a result of these investigations, ideas regarding the effect of motor fuel volatility have been greatly clarified, and it is now possible to state with quite some confidence the fuel properties required for a given condition of engine operation. Moreover, the value of the simple and rapid distillation test method was also greatly enhanced by this work due to the establishment of an interpretation of results based on experimental facts.

This work was carried out largely during the years 1922 to 1930 and is of such magnitude that it cannot be reviewed here in any detail. Moreover, the literature on the subject of relating true fuel volatility as measured by various intricate means with engine performance and the correlation of this with the distillation test is so extensive that it would be most difficult to even attempt to give proper credit to the various investigators. The same is also true of the relationship of vapor pressure of fuels and vapor locking tendencies in automobiles, and therefore direct references have been omitted in the following paragraphs briefly summarizing these findings.

Volatility of motor fuels, when related to engine performance, is not a single property, but the volatility of different portions of the fuel is of importance for different reasons.

The engine starting properties of fuels are intimately related to their A.S.T.M. front end distillation characteristics, and it is generally agreed that on the average the 10 per cent point on the A.S.T.M. distillation curve, corrected for loss, is the best available indication of the average ease of starting of a given gasoline. Therefore, if the engine temperature and air-fuel mixture supplied by the carburetor (with choke on) are defined, the 10 per cent fuel value necessary for easy starting can be closely estimated. Brown[1] states that this average relation may be expressed as follows:

Easy Starting.—Ten per cent evaporated temperature must be less than 1.25 (100 + engine temperature, deg. F.).

The middle portion of the A.S.T.M. distillation curve is related to the ease of warming up an engine and the accelerating characteristics, although this relationship is considerably more complex than that previously discussed. Manifold and carburetor details, as well as air-fuel ratios, affect the relationships involved but as an overall average Brown[1] states the following:

Satisfactory Warming Up.—A.S.T.M. 35 per cent evaporated temperature must be less than (100 + 1.5 mixture temperature, deg. F.).

Good Acceleration, Driving Conditions.—A.S.T.M. 60 per cent evaporated temperature must be less than (2 × mixture temperature, deg. F.).

Vapor Lock

The temperature of complete vaporization and the tendency toward crankcase dilution are both related to the 90 per cent point on the A.S.T.M. distillation curve. From this value may be calculated the dew point and hence the temperature at which a dry mixture of fuel and air may be formed for any given air-fuel ratio. Abnormally high values tend to promote crankcase dilution. The significance of this factor is probably not as important as those previously discussed.

One other operating characteristic which bears a relation to fuel volatility is vapor lock. Vapor lock occurs when the fuel boils excessively in any part of the fuel system as the result of being heated to such a temperature so that the vapor pressure exceeds atmospheric. It has been found that this temperature is approximately equal to the 10 per cent evaporated value of the distillation curve. A more satisfactory method for measurement of this tendency, however, is the direct determination of vapor pressure as usually carried out by the Reid method. Voluminous data have been published correlating vapor pressure and the occurrence of vapor lock in automobiles.

As a result of all this, the volatility characteristics of motor gasolines can be correctly specified and rendered suitable for any usual engine operating condition by proper choice and control of the 10, 35, 60 and 90 per cent distillation points and the vapor pressure. In fact, a study of many specifications will indicate that these control points are being used today in conjunction with

weather statistics to establish proper seasoned gradation of volatility.

Volatility Index

In spite of the fact that this method of control is neither complicated in application nor difficult of comprehension, it lacks sales appeal, and there has existed for some time a considerable demand for a still more simplified method of expressing volatility, one which, if possible, would utilize only a single term or number. It is argued that a single index of gasoline volatility would be highly acceptable to the trade in general, as there exists a natural tendency to favor a single number classification over one where the mental effort must be carried out of weighing two or more values against each other. The general adoption of such a term would therefore be a new source of inspiration to advertising departments and would make for more effective sales talks. Other arguments advanced are that it would assist the automobile builder in the design of cars, would simplify state laws and specifications, and would aid in the establishment of seasonal volatility control.

The use of such an index would require the making of several assumptions; however, in this very fact lies perhaps one of the best arguments in its favor. A general interpretation of the A.S.T.M. distillation test requires that certain assumptions regarding engine temperatures, air-fuel ratios, certain carburetor and manifold characteristics, and other features be made. Therefore, the actual accuracy may be but slightly impaired if several additional assumptions are made, as has been done in some of the following methods proposed for a simplified volatility index.

One of the earliest methods of indexing volatility was the use of the average boiling point. The Bureau of Mines has made use of this value as an expression of overall volatility, in their gasoline surveys. It was calculated by adding the initial boiling point, the maximum boiling point, and each of the 10 per cent distillation points and dividing the sum by 11.[4] This index assigns equal importance to all points on the distillation curve, which is not true, and it is therefore not desirable as an expression for volatility as related to engine performance.

Brooks and Bruce[5] have suggested a volatility index indicative of the effect of volatility on acceleration. They suggest the use of varying points on the A.S.T.M. distillation curve as key points, depending upon the mixture temperatures. For example, at 32° F. mixture temperature the 5 per cent avaporated point is the key point and at 212° F. mixture temperature the 80 per cent point is the key point. Under usual operating conditions, mixture temperatures are in the neighborhood of 150° F. to 160° F. and this system would therefore suggest that gasolines be judged for accelerating characteristics from a comparison of their 55 or 60 per cent distillation points, increased effectiveness being indicated by an increase in the reciprocal of the absolute temperature of the key point.

A much simpler proposal, serving about the same purpose, is that of Oberfell and Alden.[6] They point out that practically all commercial gasolines have 10 per cent distillation values sufficiently low for satisfactory starting and 90 per cent distillation values which are entirely permissible for satisfactory performance, but that the greatest variations occur in the middle portion of the distillation curve which governs the warm-up period. They suggest, therefore, that this characteristic be expressed in a volatility index which is calculated by the following equation:

$$\text{Volatility index} = 284 - 50\% \text{ evaporated temp., deg. F.}$$

This index can be simply calculated and does offer a means of comparing average relative warming up characteristics of fuels. It gives a good spread of values, U. S. Motor Gasoline being zero on this scale and Fighting Grade Aviation Gasoline about 72. This index is more or less an abstract number and no correction for atmospheric or mixture temperatures is included.

A somewhat similar index has been suggested by Hebl and Rendel.[7] They also discard the question of starting and point out that a fuel of satisfactory warming up characteristics is almost always satisfactory in starting characteristics. Their warming up index is calculated from the 20 and 70 per cent evaporated distillation points by means of an alignment chart which the authors have developed. However, they also recognize the effect of the test temperature on the warming up period and have therefore prepared a temperature correction which is applied to the distillation results. Their volatility index as a measure of warming up quality depends, therefore, upon the 20 and 70 per cent evaporated points and the atmospheric temperature.

This index in some respects is probably nearer technically correct than that of Oberfell and Alden. However, its determination is somewhat more complicated, which is undesirable, since a primary requisite for such an index is extreme simplicity. The question of temperature correction is, however, a vital one. It is perfectly true that the degree of volatility necessary to give a specified warming up performance differs with operating temperatures. However, whether or not this factor should be included in a volatility index is debatable. From one angle it would seem to be more desirable to keep such an index as abstract as possible, and recognize the desirability of different index values for seasonal conditions. However, through the activities of many marketers of petroleum products the general public has been educated to believe that improved quality is synonymous with increased numerical values for indices of various sorts. The case of octane numbers and viscosity indices of lubricating oils may be offered as examples of such public education. The present day car, however, cannot, in many cases, digest highly volatile gasolines in hot summer weather, particularly if such gasolines have a high vapor pressure. The general use of such an abstract index, therefore, would require that one of three things be done. Either the public would require educating to the fact that the most desirable volatility index should vary with the season, or the producer of motor fuels would be forced to excessive removal of butanes from his product in order to produce a high volatility index, low vapor pressure gasoline during the summer season, or as a third possibility, the automobile builder would be forced to build cars which could operate satisfactorily on high vapor pressure gasoline in hot weather, although this would offer little relief to cars now in operation. Therefore, the use of an index which would give identical numerical values with gasolines of varying volatility at corresponding atmospheric temperatures has much to be said in its favor.

In this connection, a paper presented by Eisinger and Barnard[8] before the June, 1935, meeting of the S.A.E. is of interest. These investigators studied the effect of partial volatility of fuels as represented by the per cent evaporated at 158° F. and the effect of total volatility of fuels as represented by the 90 per cent point on automobile acceleration with various intake manifold temperatures. They found that both of these factors were of importance, improved acceleration being made possible by either increasing the per cent evaporated at 158° F. or by lowering the 90 per cent temperature. Moreover, identical performance could be obtained by either method, as increasing the per cent at 158° F. by 1 per cent was approximately equivalent to lowering the 90 per cent value by 5° F.

While they do not propose a volatility index based on these values, their data substantiate the claim of Hebl and Rendel that a suitable volatility index should be based on points taken from both the lower and upper parts of the distillation curve. However, it can also be argued that the 50 per cent point averages the amount evaporated at 158° F. and the 90 per cent temperature and therefore if it is admitted that the index based on this value is only approximately accurate this argument holds good.

Conclusion

At the present time the A.S.T.M. distillation test can be interpreted in terms of engine performance, and when coupled with the vapor pressure test gasolines can be designed for any particular or general service. While these test methods serve admirably the purpose of the refiner and the automotive engineer, they are perhaps too complicated for presentation to the general public, and as a result the story of volatility has not been as widely told as is possible. Considerable demand, therefore, exists for a simplified volatility index which might summarize in a suitable manner the results of these other tests. Such an index would make possible the emphasizing of volatility and would primarily be of service to advertising and sales activities.

Several methods of deriving an index of this type have been proposed. They relate chiefly to the middle portion of the distillation curve and, as such, to warming up periods and acceleration in engine performance. There are, however, several factors on which complete agreement does not exist. One of these is the relative necessity for the use of one or two points on the distillation curve. It would appear that the use of one point, such as the 50 per cent value, would be preferable for the sake of simplicity and would probably be of the same degree of average accuracy as the use of several points. The second factor is the need of a method for temperature correction. This should be developed so that desirable index values can be maintained in hot weather without producing a product having excessive vapor locking tendencies in present day cars.

If these factors are properly handled, a volatility index can be evolved which would serve a decidedly useful purpose in presenting a correct story of volatility to the general driving public.

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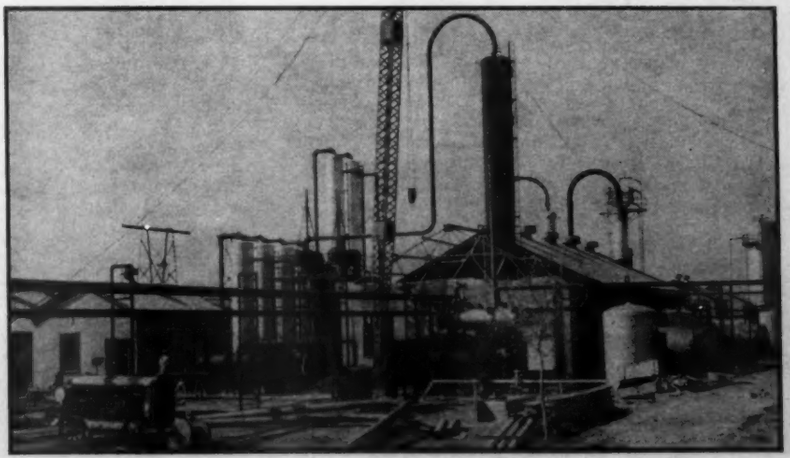

New distillation equipment being installed in Sinclair plant at Seminole, Okla.

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Natural Gasoline, Refining Industries Benefit by Association's Research

By WILLIAM F. LOWE

In April, 1921, the natural gasoline industry was in a chaotic state, lacking in standards, unity of purpose and leadership, when a small group of manufacturers met and organized the Association of Natural Gasoline Manufacturers. In the intervening 15 years the association has fought for and obtained national recognition, has become the Natural Gasoline Association of America and has been the stabilizing influence of the industry.

Purpose

The preamble of the original constitution reads as follows: "In order to more fully develop the natural gasoline branch of the petroleum industry, to establish and more fully exploit the superior qualities of natural gasoline with a view of increasing its use, to secure just and equitable freight rates and transportation conditions, to obtain fair legislation and such uniformity in manufacture as the interests of the industry may be deemed from time to time to demand, this association is formed."

The association has more than kept faith with this early pledge. It has broadened its activities to include many other problems directly affecting the natural gasoline manufacturer as all phases of the industry progressed. It has kept pace with the times and changing conditions, fostering a closer relationship between those engaged in the business and bringing about through its leadership a cooperation between conflicting interests for the betterment of the industry as a whole. It has become the national clearing house for problems of the natural gasoline industry and specializes in operating problems arising among all manufacturers east of the Rockies. Through its cooperative work with the California Natural Gasoline Association and other great groups; American Society for Testing Materials, American Petroleum Institute, American Gas Association, American Standards Association, Bureau of Explosives, Society of Automotive Engineers, U. S. Bureau of Standards, and the Western Petroleum Refiners Association, many of the present operating and specification standards of the industry have been developed and adopted on a national scale.

In addition to the large volume of technical developments concerned primarily with production and procedure methods, the association brought simplicity to the confusion existing in contractual relations through the creation and maintenance of a standard form of gas contract. During all the years of its existence there has been scarcely a time when at least one major research project, sponsored by the association, was not under way. In every case these projects had as their objective the stimulation of demand for natural gasoline.

In all of these activities the Natural Gasoline Association of America has merited the support of the entire natural gasoline industry since the results of the work were equally beneficial to all engaged in that business. Refiners, producers and marketers have found our conclusions and recommendations of distinct value, for many of the problems and discussions involved common interests.

Accomplishments

Through the work of various committees, nominated from the staffs of member companies, a volume of valuable accomplishments may be listed. Among the more important of these are:

Development of the Reid vapor pressure method for testing natural gasoline.

Development of the Reid vapor pressure method for testing of motor and aviation fuels.

Development of corrosion, color, distillation and doctor tests for natural gasoline.

Development of natural gasoline grading system.

Development of standard specifications for steel tanks for storing natural gasoline.

Development of specifications and testing methods for liquified petroleum products.

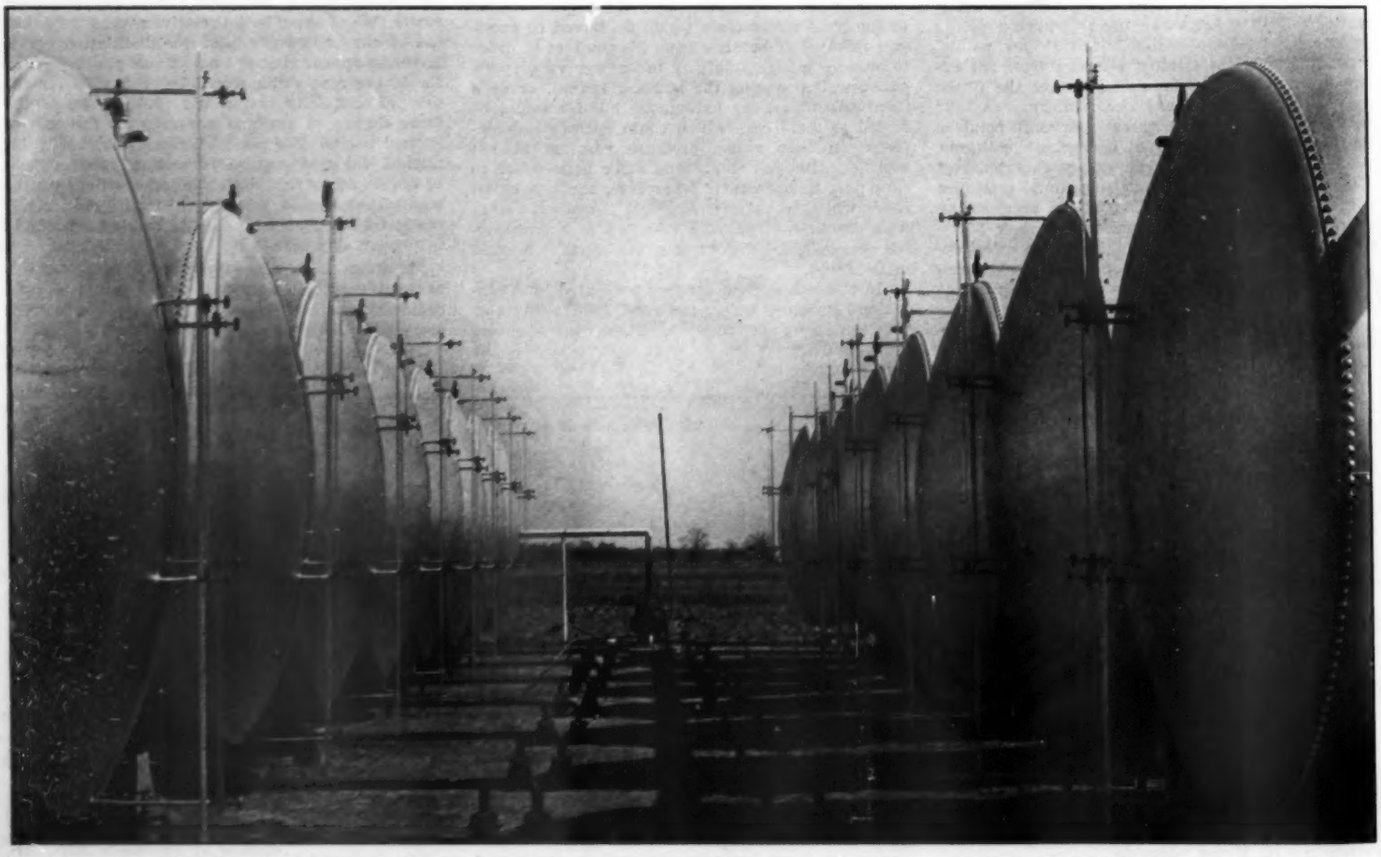
Development of gravity balance and test procedure for determining the specific gravity of gases.

Development of standard procedure for determining the gasoline content of natural gas by charcoal, absorption and compression methods.

Development of standard casinghead gas contract form.

Development of plant report forms.

While some of the above are still in a tentative



Battery of run-down tanks in new rock pressure gasoline plant recently completed at Trinidad, Tex.

standard stage, they are generally accepted throughout the industry as standard specification criteria. Complete official standardization of all projects still in the tentative stage is rapidly being carried to completion and many other projects are under consideration.

An outstanding example of its protective function was the active fight of the association against the Saybolt patents covering the absorption process for the manufacture of natural gasoline. Following the failure of other organizations to undertake the legal defense of the refining interests in this case, the association led the opposition which resulted in invalidation of these patent claims.

Research

Beginning in 1925 and continuing up to the present time, the association has had at least one research program under way at all times. This work is usually carried on by agencies outside the association though sponsored by it and financed by the member companies. The sum spent for this work has reached a total of more than $114,000. Each of these programs has had as its direct object the broadening of a market for natural gasoline. The direct results were tangible proofs of our claims that natural gasoline was a superior blending agent in motor fuels; that vapor lock in motor cars was due in large part to the design of the car; that volatility, the most valuable quality of natural gasoline, gave quick starting and rapid acceleration to motor cars; and that a change in automotive design to permit the proper use of volatile gasolines would give increased power and better all around performance.

Through the medium of annual conventions, which are open forum discussions of natural gasoline problems, the findings of this research have been given to the entire oil industry. During this entire period of research an intimate contact has been maintained with the automotive industry. As a result, there is every reason to believe that much of the present understanding of modern volatile fuels and improved automotive design is due largely to our research work.

Chief among the various research programs is that carried on at the University of Michigan under the direction of Dr. George Granger Brown, professor of chemical engineering. In 1925 Doctor Brown was assigned the problem of developing, substantiating and dramatizing the valuable characteristics of natural gasoline. He has been continuously engaged with various phases of this problem since that time. This research series began with the determination of the minimum volatility of motor fuels which would result in satisfactory performance in the cars of 1926-1928. The results of this first investigation was covered in University of Michigan Engineering Research Bulletin No. 14, a report which is still considered the most comprehensive treatise in existence on the subject of fitting fuels to engines.

Keeping pace with the changes in automotive design, which included the six and eight-cylinder engines, more complex manifolds and higher compression ratios, Doctor Brown's experiments were changed to meet these conditions. Instead of modifying the volatility of fuels to improve the performance of existing cars, the early research phase, Doctor Brown was asked to modify the cars to improve the performance obtainable from the increased volatility of available fuels.

The present two-year program, consisting largely of comparative road tests using late design cars and a wide variety of fuels in all kinds of weather, is pointed toward proving the advantage of designing cars for volatile fuels. Results to date, on a basis of starting, acceleration, economy and power, are all in favor of such fuels. Carrying the results of this work directly to the automotive industry has unquestionably been a factor in bringing about changes in engine design to permit the proper use of volatile gasolines.

U. S. Bureau of Standards

Another research project of distinct value to the industry was the investigation of the vapor lock problem. This work was begun in 1928 at the Bureau of Standards under the direction of Dr. O. C. Bridgeman and completed late in 1932. A cooperative project of the Natural Gasoline Association of America and the Cooperative Fuel Research Steering Committee of the Society of Automotive Engineers, it has as its object a study of conditions causing vapor lock. Through actual road tests under all weather conditions, using cars representing at least 90 per cent of those on the road and a variety of fuels, the conclusions reached brought entirely new conceptions of this problem. The results of this work were widely publicized and were directly responsible for curing many of the mechanical deficiencies which encouraged vapor lock in several makes of cars and led to wide changes in the fuel systems of other makes. Much of the progress which has since been made in both the automotive and refining industries might have been long delayed had this work not been done. Realizing developments of recent years make further research in this field necessary, the association is preparing to reopen the investigation to obtain additional data.

Statistics

The association issues a monthly report of Mid-Continent natural gasoline production and storage, which is compiled from individual company reports sent to its offices. This report is the most accurate of its kind and is issued on the fifteenth of the month following that covered by the assembled figures.

Other Activities

The Natural Gasoline Association of America has taken and will continue to take an active part in tax discussions where levies of unjust and confiscatory nature are proposed for the industry. It represents the natural gasoline industry in all studies concerned with casinghead gas contracting and gas royalty disputes and it actively participates in all discussions of transportation rates for the products of its members. In many other ways the association protects the varied interests of its membership and is, in every sense of the term, the clearing house for problems of the natural gasoline industry.

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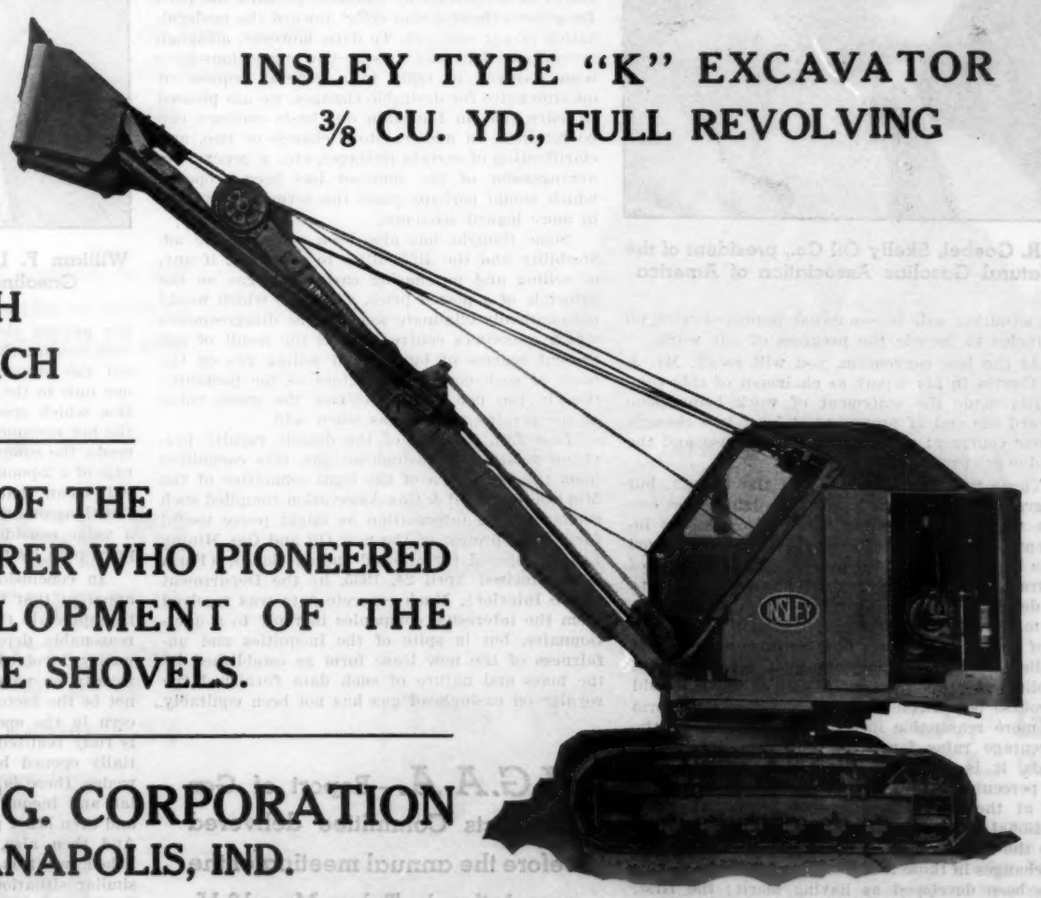

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Casinghead Gas Contract Committee Reports on Progress of Its Work

By L. A. LeFEVRE
Empire Oil & Refining Co.

During the last 12 months, in addition to following up the unfinished work of the previous year, the Casinghead Gas Contract committee has received several important assignments for deliberation, but to date, it appears that certain disturbing outside factors, the nature and importance of which will be briefly touched upon in concluding this report, have delayed our recommendations for the decision of the board of directors. It is hoped however, that for the coming year

T. R. Goebel, Skelly Oil Co., president of the Natural Gasoline Association of America

the situation will be somewhat improved with no obstacles to impede the progress of our work.

At the last convention, you will recall, Mr. J. W. Cowles in his report as chairman of this committee, made the statement of work being done toward the end of proposing at least two changes in our contract; namely, the price clause and the residue gas provision.

These two items are still on the agenda, but progress can be reported. Acknowledging those certain unavoidable disadvantages or objections inherent to a schedule of casinghead gas rates such as is incorporated in our present standard form of contract, considerable thought has been given to the development of a refinement which would without material change in the basic principles and limits of our economical set up, recognize uniform but smaller charges in the factors of sales price of gasoline and gasoline content, all of which would of course be reflected as correspondingly uniform but more reasonable increments of change in the percentage rates for casinghead gas. In other words, it is felt that if the factors controlling the percentage rates can be divided into smaller but at the same time reasonable and workable fractional parts, we will approach to a greater degree the results of a continuous curve delineating the changes in those factors. Thus far, two schemes have been developed as having merit; the first, a graphical; and the second, a tabular presentation of the problem, the latter being the preferred plan ascertained from a preliminary survey of the industry.

From an operating and accounting standpoint, therefore, we still have with us such problems as the pooling or unitization of several leases, owned by the same producer in a field all for the purpose of distributing residue gas to the best advantage of the producers; the specification of a maximum charge for boosting and transporting residue gas; the definition of boosting and what constitutes transportation; and several others. As a solution to our problems arising from the sale of surplus residue, it has been suggested that a fixed rates per 1,000 cu. ft. be stipulated as the settlement for the sale of such surplus residue gas as would normally be credited to the producer. This procedure it is felt would eliminate entirely the disagreements which sometimes arise as to the boosting and transportation costs, both of which are of course essential in computing the net selling price, which serves as our present basis of settlement for residue gas sold.

As to new work, the committee is aware of the fact that if a standard contract is to be retained with universal acceptance and application, the form sponsored and promulgated must keep abreast of the times giving due consideration to such changes as are likely to creep into the industry from time to time. The gradual appearance of riders or modifications indicates perhaps the need for serious thought and effort toward the modernization of our contract. To date, however, although several excellent and constructive suggestions have been received in reply to a general request or questionnaire for desirable changes, we are pleased to learn that in the main our basic contract can be retained. In addition to a change or two, and clarification of certain passages, etc., a general rearrangement of the contract has been proposed which would perhaps place the several provisions in more logical sequence.

Some thought has also been given to the advisability and the difficulties to overcome, if any, of selling and purchasing casinghead gas on the principle of a posted price, a feature which would automatically eliminate some of the disagreements which sometimes confront us as the result of our present scheme of buying and selling gas on the basis of such contingent factors as the participation in the net and sometimes the gross value of the surplus residue gas when sold.

Last fall, in view of the drastic royalty provision relating to casinghead gas, this committee upon the suggestion of the legal committee of the Mid-Continent Oil & Gas Association compiled such comments and information as might prove useful for a joint protest of the new Oil and Gas Mining Lease proposed for allotted Indians lands, (Form 5-154, Revised April 24, 1935, by the Department of the Interior). Much concrete data was received from the interested companies in reply to a questionnaire, but in spite of the inequities and unfairness of the new lease form as established by the mass and nature of such data furnished the royalty on casinghead gas has not been equitably adjusted. Consequently, for such gas as is utilized in the future from allotted Indian lands, and under the new lease form, the royalty will be computed on the value of the casinghead gas or on the products thereof (such as residue gas, natural gasoline, propane, butane, etc.) which ever is the greater.

As a matter of fact, the situation is much worse than that under the new regulation, the lessee will pay royalty on money which neither he

William F. Lowe, secretary of the Natural Gasoline Association of America

nor anyone else receives. In other words, taking into account the confusion of pressure bases without the proper and corresponding correction for one unit to the other, and furthermore the regulation which specifies royalty as a fraction of not the net revenue, but rather of the total gross proceeds, the computation of royalty payments at the rate of a 2-pound price applied to 10-ounce volumes will mean that the lessee will pay royalty on a fictitious or arbitrarily created value of the gas—a value considerably in excess of the total gross price paid by the gas purchaser.

In conclusion, it is becoming more and more apparent that the several producers are beginning to appreciate the seriousness of arbitrary and unreasonable departmental rulings. Although the money involved in the matter of excess Indian royalty on natural gasoline and residue gas may not be the factor of paramount importance or concern in the operation of an oil and gas lease, it is fully realized however, that with the door partially opened by casinghead gas as the entering wedge, there is danger of the application of similar and inequitable rulings or regulations to oil and even other products of the petroleum industry. And then also, with this precedent once established, what is to prevent the development of a similar situation for state and public lands, and finally, the jump to commercial leases.

***N.G.A.A.*—Report of Gas Contracts Committee delivered before the annual meeting of the association in Tulsa, May 13-15.**

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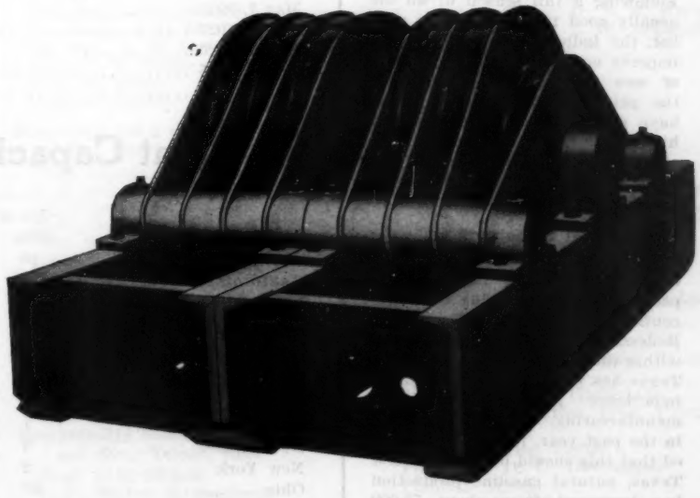

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Number of Plants Continues Decline But Total Capacity Shows Increase

By D. H. STORMONT

The natural gasoline industry witnessed in the past year a continuance in reduction of the number of plants operating in the United States. This trend which began in 1928 has continued steadily since that time so that the number of plants has been reduced from 1,229 in 1928 to the present total of 840. The 1936 total is 10 less than that of 1935, and although there were several new plants built during the past year they were mostly of relatively large capacity so that the combined capacity of all the units operating in the United States increased 124,000 gallons. This fact might be expected since the past few years has recorded a decided change from the practice of former years; that of each producer building a small plant to process the gas produced from his wells. Now it is the general practice for producers to turn gas from their wells over to a company or individual to process through a single unit.

During the past year there was not an unusual amount of new plant construction and as a result practically all the important natural gasoline manufacturing states witnessed a decrease in the number of plants within its borders. Texas was an exception to this rule and due to the immense quantities of natural gas available in the East Texas field and the Panhandle the total number of plants showed a slight increase.

However, over the first quarter of 1936 there has been a decided increase in new plant construction and remodeling of old equipment. Following a fall season of an unusually good natural gasoline market, the industry responded to the impetus and set out on a program of new construction. Since then the prices of the various grades have declined somewhat from the high of 1935 but at present there are several large plants under construction and many more planned to be built during the year.

Plant Construction

A great portion of new plant construction taking place in the past year and now being built was confined to the East Texas and Rodessa fields. Since it is only within the past two years that East Texas has proved to be a factor of importance in natural gasoline manufacturing, and Rodessa only in the past year, it is to be expected that this should be true. In East Texas, natural gasoline production has increased from about 71,000 gallons daily in January, 1934, to approximately 242,000 gallons during the last six months of 1935. Completion of plants under construction and those planned should increase the daily output of this district to about 370,000 gallons during the latter months of this year. This latter figure is probably near the maximum natural gasoline production of this district under the present allowable crude oil production.

In the Rodessa field there are now four plants being built or are definitely planned for construction in the immediate future. The plant being built by the Pelican Oil & Gasoline Co. in the Rodessa field is in the final stages of construction and trial runs are to be made the early part of May. The plant has a capacity of 50,000,000 feet of gas daily and is of the compression type. East Texas Refining Co. also is constructing a plant in this area while Glenrose Gasoline Co. recently began construction of a new 15,000,000-foot plant. The most recent plant announced for construction in this area is one located on properties of the United States Public Service Co. This plant when completed will be one of the largest in the field, producing about 50,000 gallons of gasoline daily. It has been estimated that if crude oil production continued to increase at the present rate, by late fall the daily output of this area should approximate 300,000 gallons.

Another new plant construction job recently announced was that of the Manhattan Gasoline Co. The construction of the plant is now under way in the Plymouth field, Texas, and when completed will have a daily capacity of producing 8,000 gallons. Construction in Oklahoma and California consisted mostly of remodeling and enlarging present plants with but few new plants being built.

Propane Extraction

One trend of particular note taking place during the past year is that of installing propane and butane extraction equipment. This is especially true in East Texas where the gas contains high percentages of these hydrocarbons. The development and utilization of this type equipment is expected to be relatively slow and only the more modern plants will become gradually equipped to extract these gases.

A major construction program along this line was initiated in the latter part of December, 1935, through an arrangement of Hanlon-Buchanan, Inc., Humble Oil & Refining Co. and Humble Pipe Line Co. The plan of operation provided for the addition of extraction and fractionating equipment in the plants of Hanlon-Buchanan and six affiliated natural gasoline companies operating in the East Texas field. These plants were to be tied together by pipe lines and the products of the various plants gathered and delivered through a 200-mile pipe line to the Humble refinery at Baytown. Here it will be processed to supply charging stock for a new polymerization unit.

Proration and the adoption of a definite gas-oil ratio in all major fields has a decided influence on natural gasoline manufacture. Since the wells supplying a plant are produced for only a short period of time daily, the number of wells tied into the gathering system must be greatly increased. Then, too, a schedule must be worked out to insure a constant, uniform supply of gas. Despite the effect these factors have on production and also the effects of a natural decline in available gas the total natural gasoline production during 1935 was 38,858,000 bbls. or 2,300,000 bbls. more than was produced in 1934.

In summarizing the data shown in the accompanying table and list of natural gasoline plants operating in the United States attention is drawn to the fact that whereas the number of plants shut down increased, the capacity of these plants was less than those idle in 1935. Many plants which were carried in last year's survey as closed down were reported as being dismantled, thus the increase in the total number of idle plants can be accounted for only by the closing down of other plants. Therefore the number of plants should continue to decline yearly as the smaller, uneconomical plants are replaced.

Natural Gasoline Industry

	No. of plants	Daily capacity (gallons)
May 1, 1936	840	10,033,687
May 1, 1935	850	9,909,797
May 1, 1934	882	10,241,980
May 1, 1933	919	10,308,354
May 1, 1932	948	10,536,182
May 1, 1931	987	10,531,511
May 1, 1930	1,071	9,541,320
May 1, 1929	1,124	8,695,727
May 1, 1928	1,229	7,865,652
May 1, 1927	1,148	6,947,264
May 1, 1926	1,063	5,121,000
May 1, 1925	1,143	4,642,561
May 1, 1924	1,012	3,396,961

Plant Capacities by States

	Status of plants May 1 — No. of plants		Daily capacity (gals.)	
	1936	1935	1936	1935
Arkansas	10	10	62,265	93,250
California	114	126	3,377,555	3,417,555
Colorado	2	2	12,000	12,000
Illinois	58	59	42,886	42,901
Kansas	23	23	240,171	211,200
Kentucky	6	6	39,900	39,900
Louisiana	40	41	395,530	368,100
Michigan	2	1	10,000	4,000
Montana	1	1	9,000	9,000
New Mexico	3	2	120,000	70,000
New York	2	2	500	900
Ohio	16	20	59,776	63,071
Oklahoma	184	194	2,191,458	2,263,516
Pennsylvania	125	128	125,588	126,898
Texas	138	129	2,739,892	2,597,409
West Virginia	105	94	415,906	383,936
Wyoming	11	12	191,260	206,160
Total	840	850	10,033,687	9,909,797

Note—May 1, 1935, includes 91 plants with 679,830 gallons daily capacity listed as shut down, May 1, 1936, includes 109 plants with 615,760 gallons daily capacity listed as shut down.

Natural Gasoline Company Personnel

Abbreviations:

Chm. Bd.—Chairman of Board
Pres.—President
V. P.—Vice President
Sec.—Secretary
Treas.—Treasurer
Gen. Mgr.—General Manager
Gen. Supt.—General Superintendent
Sales Mgr.—Sales Manager
Tank Car S. M.—Tank Car Sales Manager
Pur. Agt.—Purchasing Agent
Traf. Mgr.—Traffic Manager
Ch. Egr.—Chief Engineer
Supt.—Superintendent
Asst. Supt.—Assistant Superintendent
Ch. Chem.—Chief Chemist
Capacity—gallons per day

A

Airolene Gasoline Corp., 723 Kennedy Bldg., Tulsa, Okla.

Pres., Forrest E. Gilmore
V. P., Carl W. Gilmore
Sec.-Treas., H. O. Whitfield
Gen. Supt., Carl W. Gilmore
Pur. Agt., Jess Patterson
Supt., Jess Patterson, Box 772, Shamrock, Tex.
Plant in Texas.
Capacity, 8,000.

Alum Rock Gas Co., National Transit Bldg., Oil City, Pa.

Pres., R. P. Stevens, 120 Broadway, New York City
V. P., J. H. Isherwood, Port Allegany, Pa.
Sec., J. C. Forsyth
Treas., C. R. Beddows, 120 Broadway, New York City
Supt., Roy Klinger, Knox, Pa.
Plant in Pennsylvania
Capacity, 200

American Natural Gasoline Co., National Bank of Tulsa Bldg., Tulsa, Okla.

Pres., W. K. Warren
V. P., J. A. La Fortune
Sec., H. E. Felt
Treas., A. J. Murphy
Gen. Supt., M. E. Mockley
Sales Mgr., J. A. La Fortune
Ch. Chem., S. S. Allender
Pur. Agt., A. J. Murphy
Ch. Egr., H. W. Harts
Supt., Walter Smith, Shamrock, Tex.
Plant in Texas
Capacity, 60,000

American Oil Development Co., 1601 Oliver Bldg., Pittsburgh, Pa.

Pres., Harry S. Tack
V. P. and Gen. Mgr., Theodore E. Tack
Sec., Willis Siegfried
Treas., A. V. Tack
Gen. Supt., John Petty
Supts., G. H. Haynes, Box 125, Robinson, Ill.; S. E. Hoover, Middlebourne, W. Va.; M. T. Hooper, St. Marys, W. Va.; G. G. Morgan, Meadeville, W. Va.; J. H. Petty, Fly, Monroe County, Ohio; H. G. Bradfield, R.F.D. 2, New Matamoras, Ohio
Plants in West Virginia and Illinois
Capacity, 1,400

Apex Gas, Inc., Gover Bldg., Mount Pleasant, Mich.

Pres., James C. Graves
V. P., Dr. Virgil D. R. Kirkham
Sec.-Treas., C. L. Maguire
Gen. Supt. and Pur. Agt., T. N. Rutherford, Breckenridge, Mich.
Plant located in Michigan
Capacity, 4,000

Arab Gasoline Corp., Exchange National Bank Bldg., Eastland, Tex.

Pres., Samuel Butler
V. P., P. T. Sharples, Philadelphia, Pa.
Sec.-Treas., W. E. Cox, Philadelphia, Pa.
Gen. Supt., Franklin Dwyer, Eastland, Tex.
Pur. Agt., R. L. Allen
Ch. Egr., W. E. Coleman
Plants in Texas
Capacity, 35,000 (10,000 shut down)

Arkansas Natural Gas Companies (including Arkansas Natural Gas Corp., Arkansas Fuel Oil Co., Arkansas-Louisiana Pipe Line Co., and Rodessa Natural Gas Co.), Ardis Bldg., Shreveport, La.

Pres., H. L. Doherty
V. P.s, D. W. Harris and J. R. Munce
Sec., T. J. Heard
Treas., B. R. Muirhead
Gen. Supt., A. H. Weyland
Ch. Egr., H. T. Goss
Pur. Agt., J. Lucas
Supt. Gaso. Div., E. P. Farmer
Supts., C. Zeppa, Exchange Bldg., El Dorado, Ark.; T. S. Gordon, Box 668, Homer, La.; J. P. Smithson, Vivian, La.; T. F. Gordon, Box 1659, Longview, Tex.
Plants in Louisiana, Arkansas and Texas
Capacity, 75,000

B

Bankline Oil Co., 634 S. Spring St., Los Angeles, Calif.

Pres., John Barneson
V. P.s, H. J. Barneson and J. L. Barneson
Sec.-Treas., W. E. Kropp
Gen. Mgr., L. L. Aubert
Pur. Agt., John C. Penn
Supt., L. J. Patrosso, Box 6203, Signal Hill, Calif.
Plant in California
Capacity, 25,000

Barbary & Hardt, Wildwood, Pa.

Plant in Pennsylvania
Capacity, 11

Barnsdall Oil Co., Petroleum Bldg., Tulsa, Okla.

Pres., E. B. Reeser
Exec. V. P., R. A. Broomfield, Los Angeles, Calif.
V. P.s, D. R. Snow; D. L. Frawley, Pittsburgh, Pa.; W. C. Whaley, Los Angeles, Calif.; R. A. Broomfield, Jr., Los Angeles, Calif.
V. P. and Sec., James A. Dunn, New York City
V. P. and Treas., L. D. Messner
Gen. Supt., A. J. Schlosser
Sales Mgr., George J. Locke
Pur. Agt., O. E. McClatchey
Ch. Egr., J. T. Hayward
Supts., J. O. Green, Box 518, Earlsboro, Okla.; A. H. Sayler, Box 156, Beggs, Okla.; G. R. Nicholas, Box 228, Osage, Okla.; E. E. Troyer, Box 224, Avant, Okla.; F. W. Tunstall, R.F.D. 8, Tulsa, Okla.; C. I. Stearns, R.F.D. 1, Barnsdall, Okla.; R. W. Shannon, Route 2, Box 173, Oxford, Kans.; G. T. Granger, Box 61, Okmulgee, Okla.
Plants in Oklahoma, Kansas and California
Capacity, 115,500

Bartlett Gasoline Co., 1801 National Bank Bldg., Tulsa, Okla.

Pres., John H. McCoy
V. P., Dean E. Foster
Sec.-Treas., H. R. Johnson
Gen. Supt., Dean E. Foster
Sales Mgr., A. J. Pfister
Pur. Agt., Dean E. Foster
Supt., E. W. Melling, Box 467, Butler, Okla.
Plant in Oklahoma
Capacity, 11,000

Bayliss and Fasenmeyer, Titusville, Pa.

Plant in Pennsylvania
Capacity, 1,000

Bell Bros., Robinson, Ill.

Plants in Illinois
Capacity, 310

Belridge Oil Co., Edison Bldg., Los Angeles, Calif.

Pres., Burton E. Green
V. P.s, Frank H. Buck, H. L. Westbrook, F. B. Fulton
Sec., F. B. Sutton
Treas., W. L. Westbrook
Gen. Supt., C. E. Coleston
Pur. Agt., W. C. Wickersham
Plants in California
Capacity, 67,000

Big Four Oil & Gas Co., Boyd & Watson Sts., Pittsburgh, Pa.

Plant in Illinois
Capacity, 300

Big Lake Oil Co., 223 Fourth Ave., Pittsburgh, Pa.

Pres., J. G. Farquhar
V. P.s, A. B. Dally, Jr., W. S. Hallanan
V. P. and Gen. Mgr., C. E. Beyer
Sec.-Treas., W. E. Huston
Gen. Supt., C. R. Johnson, Texon, Tex.
Pur. Agt., R. E. Johnson
Ch. Chem., J. C. Moore
Ch. Egr., A. G. Stell
Supt., C. C. Hickle, Texon, Tex.
Plant in Texas
Capacity, 50,000

Blue Creek Oil & Gas Co., 705 Security Bldg., Charleston, W. Va.

Pres., George E. Thomas
V. P. and Gen. Supt., D. T. McClure
Sec.-Treas., G. E. Tribble
Supt., G. W. McCamey, Blue Creek, W. Va.
Plant in West Virginia
Capacity, 2,500

Brea Canon Oil Co., 831 Standard Oil Bldg., Los Angeles, Calif.

Pres., Dan Murphy
Sec., G. Holterhoff, Jr.
Plant in California
Capacity, 14,000

Breckenridge Gasoline Co., 2313 Madison Ave., Toledo, Ohio

Pres., A. S. Hickok
V. P., Walter G. Kirkbride
Sec.-Treas., C. F. Eisenhour
Gen. Supt., R. L. Ponsler
Plant in Texas
Capacity, 7,000

Brenneman & MacDonnell, 312 South Cole St., Lima, Ohio

Gen. Supt., E. R. Perfect
Plants in Illinois
Capacity, 1,250

Buckeye Natural Gasoline Corp., 504 E. Archer St., Tulsa, Okla.

Pres., Charles C. Cartwright, Fort Worth, Tex.
V. P., A. V. B. Candler
Sec.-Treas., James T. Neal
Gen. Supt., E. C. Smith, Magic City, Tex.
Ch. Chem., H. S. Wilson, Magic City, Tex.
Ch. Egr., R. B. McQuiddy, Magic City, Tex.
Pur. Agt., H. E. Heywood
Supt., E. C. Smith, Magic City, Tex.
Plant in Texas
Capacity, 15,000

C

Calumet Oil Co., 517 I. W. Hellman Bldg., Los Angeles, Calif.

Pres., J. E. Wallis
V. P., T. H. Collins, H. Browning Landes
Sec.-Treas., W. F. Staunton
Gen. Supt., J. C. Armstrong
Pur. Agt., Irene Trelease
Plant in California
Capacity, 900

Canadian River Gas Co., Colorado Springs, Colo.

Pres., N. K. Moody, Tulsa, Okla.
V. P.s, P. C. Spencer, A. R. Jones
Sec.-Treas., George Baird, New York, N. Y.
Gen. Mgr., Ford, Bacon & Davis, Inc., F. J. Trelease
Gen. Supt., G. A. Woods, Gas Bldg., Amarillo, Tex.
Pur. Agt., L. B. Whitefield
Supt., Harrison F. Johnson, Channing, Tex.
Plant in Texas
Capacity, 30,000

Cannon Gasoline Co., Commerce Bldg., Amarillo, Tex.

Pres., J. J. Hastings
V. P., F. J. Storm
Sec., J. B. Dooley
Treas., F. J. Storm
Plant in Texas
Capacity, 5,000

Carbide & Carbon Chemicals Corp., 30 E. Forty-second St., New York City

Pres., J. A. Rafferty
V. P.s, G. O. Curme, Jr., R. W. White, H. E. Thompson, J. W. McLaughlin, J. G. Davidson
Sec., A. C. Cornell
Treas., C. T. Ayres
Sales Mgr., W. F. Reich, Jr.
Gen. Supt., R. N. Graham
Ch. Chem., G. V. Scofield
Pur. Agt., W. F. Ackerman
Ch. Egr., C. S. Dunn
Supts., C. M. Stuter, Hastings, W. Va.; T. R. Ragland, Jr., Diamond, W. Va.
Plants in West Virginia
Capacity, 3,500

Cargray Corp., Amarillo Bldg., Amarillo, Tex.

Pres., Vernon F. Taylor
V. P.s, D. D. Harrington, Stanley Marsh, L. R. Hagy
Sec.-Treas., E. D. Timberlake
Gen. Supt., Charles Free, Pampa, Tex.
Ch. Chem., Don Taylor
Pur. Agt., D. D. Harrington
Plant in Texas
Capacity, 100,000

Carter Oil Co., National Bank of Tulsa Bldg., Tulsa, Okla.

Pres., C. H. Lieb
V. P.s, J. J. Conry, James A. Veasey
Sec., James A. Veasey
Treas., C. D. Mill
Gen. Supt., F. W. Floyd
Sales Mgr., H. F. Miller
Pur. Agt., J. R. Freeman
Ch. Egr., M. L. Haider
Supts., F. W. Bruner, Oklahoma City, Okla.; R. L. Clifton, Seminole, Okla.; W. B. Crutcher, Ponca

City, Okla.; S. W. Emery, Seminole, Okla.; R. W. Kirkpatrick, Wilson, Okla.
Plants in Oklahoma
Capacity, 87,000

Casto Oil Co., 318½ Juliana St., Parkersburg, W. Va.

Partnership of Ira Williams and Ross Wells
Gen. Supt., Ira Williams
Plant in West Virginia
Capacity, 250

Central States Production Corp., 700 Oklahoma Bldg., Tulsa, Okla.

Pres., H. T. Pritchard
V. P.s, J. N. Canavan, B. F. Pickard
Sec., W. A. Horner
Treas., Neille Richards
Gen. Supt., W. F. Hebeler
Supt., M. V. Davies, Wetumka, Okla.
Pur. Agt., E. J. Kersting
Plant in Oklahoma
Capacity, 1,000 (shut down)

Chambers Oil Co., 214 Chambers Bldg., Oil City, Pa.

Plant in Pennsylvania
Capacity, 150

Chief Refining Co., Gladewater, Tex.

Pres., H. C. Haberle
Sec.-Treas., L. B. Haberle
Gen. Supt., S. B. Moreau
Ch. Chem., F. R. Purvis
Plant in Texas
Capacity, 5,000

Clinger Oil & Gas Co., Tidioute, Pa.

Pres., A. V. Clinger
V. P., George Clinger
Pur. Agt. and Treas., W. F. Clinger
Supts., C. R. Boyd, Truemans, Forest County, Pa.; J. E. Peterson, R.F.D. 3, Tidioute, Pa.
Plants in Pennsylvania
Capacity, 1,000

Clymore Co., Inc., 604 Nixon Bldg., Corpus Christi, Tex.

Pres., Garland Clymore
V. P., George E. Smith
Sec.-Treas., Eunice Finch
Gen. Supt., R. S. Wyrick, Refugio, Tex.
Ch. Chem., V. A. Goss
Plant in Texas
Capacity, 30,000

Cockran (John G.) & Co., 676 W. Main St., Sheffield, Pa.

Owner and operator, John G. Cockran
Supt., J. C. Curtin, Barnes, Pa.
Plant in Pennsylvania
Capacity, 1,100

C. J. Coffin, Chicora, Pa.

Owner and operator, C. J. Coffin
Supts., C. W. Miller, Route 1, Karns City, Pa.; George Work, Route 2, Chicora, Pa.
Plants in Pennsylvania
Capacity, 170

Coline Gasoline Corp., Kerckhoff Bldg., Los Angeles, Calif., or Tradesmens Bank Bldg., Oklahoma City, Okla.

V. P.s, H. L. Briggs, Oklahoma City; F. C. Ripley, Los Angeles, Calif.
Sec., C. W. Sowle, Oklahoma City
Treas., J. W. Price, Oklahoma City
Supts., Harold Moulton, Kerckhoff Bldg., Los Angeles; L. J. Gude, Oklahoma City
Plants in Oklahoma and California
Capacity, 41,000

Coltexo Corp., Monroe, La.

Pres., F. F. Curtze, Erie, Pa.
V. P. and Sec., Reid L. Carr, New York City
Treas., G. L. Bubb, New York City
Gen. Supt., H. H. Reardon
Sales Mgr., W. H. Anders
Ch. Chem., H. J. Hunter
Ch. Egr., A. T. Givens
Supts., J. P. Cox, Lefors, Tex.; H. E. Means, Lefors, Tex.; W. R. Wise, Lefors, Tex.; W. E. Reardon, Monroe, La.
Plants in Texas
Capacity, 50,000 (10,000 shut down)

Columbian Gasoline Corp., Monroe, La.

Pres., F. F. Curtze, Erie, Pa.
V. P. and Sec., Reid L. Carr, New York City
Treas., George L. Bubb, New York City
Gen. Supt., H. H. Reardon
Sales Mgr., W. H. Anders
Ch. Chem., H. J. Hunter
Ch. Egr., A. T. Givens
Supts., W. E. Reardon; R. A. Boyd, Fairbanks, La.; J. S. Dunn, Swartz, La.; J. F. Morris, R.F.D. 2, Bastrop, La.; B. F. Spigener, Fairbanks, La.; R. E. Biggs, Alto, La.; G. W. Ross, Shamrock, Tex.
Plants in Texas and Louisiana
Capacity, 16,000

Continental Oil Co., Ponca City, Okla.

Pres., D. J. Moran
V. P.s, W. W. Bruce, Walter Miller. W. H. Fergerson
Sec., James J. Cosgrove
Treas., G. F. Smith
Supt., R. A. Carter
Sales Mgr., H. J. Kennedy
Pur. Agt., W. H. O'Conner
Ch. Chem., B. H. Lincoln
Ch. Egr., M. E. Clawson
Supts., R. G. Kennelly, Columbine, Wyo.; Chas. R. Allen, Wellington, Colo.
Plants in Oklahoma, Texas, Colorado, Wyoming and New Mexico
Capacity, 146,000. Five of the plants listed operated in conjunction with other companies as shown under respective states.

Consolidated Gasoline Co., 2313 Madison Ave., Toledo, Ohio

Pres., A. S. Hickok
V. P., Walter G. Kirkbride
Sec.-Treas., C. F. Eisenhour
Gen. Supt., R. L. Ponsler, Box 488, Eastland, Tex.
Supt., W. J. Polk, Box 897, Breckenridge, Tex.
Pur. Agt., H. M. Condley, Box 647, Cisco, Tex.
Plants in Texas
Capacity, 12,000

Consolidated Gas Utilities Corp., 411 Beacon Bldg., Wichita, Kans.

Pres., Logan W. Cary
V. P., E. C. Joullian
Sec.-Treas., J. W. Metcalfe
Gen. Supt.-Pur. Agt., C. S. Worley
Supt., W. H. Shaffer, Wellington, Kans.
Plant in Kansas
Capacity, 12,000 (shut down)

Cook Oil Lease, Kelletville, Pa.

Owner, E. S. Collins, Portland, Ore.
Mgr., F. R. Klinestiver, Nebraska, Pa.
Sec., James E. Flynn
Ch. Egr., F. Lee Dunkle, Mayburg, Pa.
Plant in Pennsylvania
Capacity, 300

Cowan Oil & Refining Co., Cowan Bldg., Springs St., Los Angeles, Calif.

Pres., John A. Arnold
Sec.-Treas., W. G. Howard
Plant in California
Capacity, 10,000

Crescent Gasoline Co., Overton, Tex.

Plant in Texas
Capacity, 7,000

J. E. Crosbie, Inc., National Bank of Tulsa Bldg., Tulsa, Okla.

Pres., J. E. Crosbie
V. P., W. B. Moran
Sec., M. E. Church
Treas., C. H. Sweet
Pur. Agt., A. W. Dwen
Supts., D. B. Young, Box 59, Ada, Okla.; J. Y. Seward, Box 128, St. Louis, Okla.; S. M. Barrett, Box 1795, Holdenville, Okla.; E. K. Crosbie, Ada, Okla.
Plants in Oklahoma
Capacity, 76,000

Crosbie, Porter & Martin, Box 625, Okemah, Okla.

Plant in Oklahoma
Capacity, 20,000

Cushing Refining & Gasoline Co., Cushing, Okla.

Pres., E. C. Mullendore, Cleveland, Okla.
V. P.s, Rex H. Winget, R. C. Jones
Sec., M. E. James
Gen. Supt., C. A. Carlson
Sales Mgr., E. O. Derrick
Pur. Agt., Rex H. Winget
Supts., B. C. Wedelin, Ripley, Okla.; B. E. Jones, Blackwell, Okla.
Plant in Oklahoma
Capacity, 15,000

D

Danciger Oil & Refineries, Inc., W. T. Waggoner Bldg., Fort Worth, Tex.

Pres., Dan Danciger
V. P., Jack Danciger
Pur. Agt., G. B. Magruder, Jr.
Supts., F. L. Abraham, Box 278, Lefors, Tex.; Guy Barritt, Danciger, Tex.
Plants in Texas
Capacity, 15,000

Daugherty & Co. (C. R.), Y. M. C. A. Bldg., Butler, Pa.

Partnership, C. R. Daugherty and M. G. Daugherty
Plants in Pennsylvania
Capacity, 125

Deep Rock Oil Corp., Atlas Life Bldg., Tulsa, Okla.

Trustee, H. N. Greis
Gen. Supt., R. K. Huey
Sec.-Treas., W. R. Francisco
Pur. Agent, R. G. Martin
Ch. Egr., C. O. Moss
Ch. Chem., B. C. Frischot, Cushing, Okla.
Supt. in charge of plants, C. O. Moss, Box 485, Drumright, Okla.
Supts., Geo. Wolterhausen, Cushing, Okla.; Elmer Singer, Shamrock, Okla.
Plants in Oklahoma
Capacity 4,700

Del Rey Oil & Gas Co., Washington St. and Beach Ave., Venice, Calif.

Pres., A. E. Schiltz
V. P., F. A. E. Lowell
Asst. Sec., H. A. Wohlenberg
Ch. Chem., A. Pfeil
Ch. Egr., J. P. Magee
Supt., L. C. Vincent
Plant in California
Capacity, 75,000

Dempseytown Gas Co., 103 Will St., Port Allegany, Pa.

Pres., C. I. Crippen, 30 Broad St., New York City
V. P., J. H. Isherwood, Port Allegany, Pa.
Sec., J. C. Forsyth, 30 Broad St., New York City
Treas., C. R. Beddows, 30 Broad St., New York City
Supt., H. K. Dietterick, Knox, Pa.
Plants in Pennsylvania
Capacity, 300

Devonian Oil Co., 1705 National Bank of Tulsa Bldg., Tulsa, Okla.

Pres., J. H. Evans
V. P.s, A. W. Leonard, L. C. Ritts
Sec., G. D. Foster
Treas., L. C. Ritts
Pur. Agt., H. R. Dean
Supts., E. S. Calvert, Box 57, Overton, Tex.; C. C. Woodson, Box 106, Kelleyville, Okla.
Plants in Oklahoma
Capacity, 30,000 (10,000 shut down)

Dinsmoor & Co., 702 Second St., St. Marys, W. Va.

Pres., J. D. Dinsmoor
V. P.s, L. E. Dinsmoor, Marietta, Ohio; F. K. Sellers
Sec.-Treas., W. P. Kerwood, Jr.
Supt., D. H. Isreal, St. Marys, W. Va.
Plants in West Virginia
Capacity, 346

Dunlap, Harry G., Chicora, Pa.

Plants in Pennsylvania
Capacity, 11

E

Eagle-Picher Mining & Smelting Co., 214 West Third St., Joplin, Mo.

Pres., A. E. Bendelari, Cincinnati, Ohio
V. P.s, G. W. Potter, Joplin, Mo.; F. W. Potts, Cincinnati, Ohio
Sec.-Treas., Joseph Hummel, Jr., Cincinnati, Ohio
Gen. Supt., D. C. MacKallor, Picher, Okla.
Supt., W. N. Corbet, Henryetta, Okla.
Plant in Oklahoma
Capacity, 3,000

Eason Oil Co., Bass Bldg., Enid, Okla.

Pres., T. T. Eason
V. P., L. D. Hinman
Sec.-Treas., T. W. Eason
Gen. Supt., W. H. Taft
Sales Mgr., R. H. Rowland
Pur. Agt., A. C. Hatton
Ch. Chem., G. B. Lyons
Ch. Egr., W. H. Taft
Supts., T. E. Sisk, Box 273, Covington, Okla.; B. T. Weidner, Crescent, Okla.; P. J. Maranville, Enid, Okla.
Plants in Oklahoma
Capacity, 34,000

Edington Gasoline & Refining Co., Inglewood, Calif.

Pres., C. B. Edington
Plant in California
Capacity, 6,000

Eddie O. Edwards, R.F.D. 2, Titusville, Pa.

Plant in Pennsylvania
Capacity, 170

Eiswerth-Hefren & Co., Lucinda, Pa.

Pres., F. M. Baker
V. P., W. J. Ochs
Sec.-Treas., J. F. Eiswerth
Plant in Pennsylvania
Capacity, 400 (shut down)

Ellenberger & Sons (Wm. J.), R.F.D. 1, Karns City, Pa.

Plant in Pennsylvania
Capacity, 300

Elliott Bros., R.F.D. 2, Chicora, Pa.

Plant in Pennsylvania
Capacity, 500

Empire Oil & Refining Co., Empire-Masonic Bldg., Bartlesville, Okla.

Pres., F. R. Coates
V. P.s, H. D. Frueauff, H. R. Straight, A. W. Ambrose
Sec., C. E. Murray
Div. Mgr., E. L. Peck
Supervisors, H. A. Ells, E. L. Stauffacher
Sales Mgr., S. B. Crooks
Pur. Agt., G. E. Goddard
Supts., L. A. Webster, Madison, Kans.; E. Williams, R.F.D. Teter, Hamilton, Kans.; R. W. Johnston, Tallant, Okla.; W. H. Tillock, Route 2, Wanette, Okla.; P. J. Phillips, Drawer "T," Konawa, Okla.; E. R. Estus, Box 395, Seminole, Okla.; L. L. Grubb, Box 395, Seminole, Okla.; J. F. Hodge, Route 1, Box 600, Seminole, Okla.; J. A. Dowler, Box 2093, Wichita, Kans.; V. F. Hobart, Box 1742, Pampa, Tex.; J. L. Sperry, Box 1328, Wewoka, Okla.; D. G. Thoes, Box 498, Burrton, Kans.; C. F. Fischer, Sasakwa, Okla.
Dist. Supts., Dick Rodgers, Box 2093, Wichita, Kans.; J. W. Wilson, Box 1205, Seminole, Okla.
Plants in Oklahoma, Kansas and Texas
Capacity, 332,000 (22,000 shut down)

Enfisco Oil Corp., Box 2021, Tulsa, Okla.

Pres., Edward N. Fisher
V. P.s, S. S. Smith, J. F. Dittman
Sec., M. Jerome
Treas., L. J. Margulies
Plant in Oklahoma
Capacity, 1,500

Equitable Gas Co., 435 Sixth Ave., Pittsburgh, Pa.

Pres., F. R. Phillips
V. P., F. F. Schauer
V. P. Chg. Sales, Joseph McKinley
Sec., W. B. Carson
Treas., C. J. Braun, Jr.
Oper. Mgr., D. P. Hartson
Gaso. Supt., Judson Bonsall
Pur. Agt., C. W. Lepper
Supts., G. M. Myer, Rogersville, Pa.; P. E. Jackson, R.F.D. 1, Clarksville, Pa.
Plants in Pennsylvania
Capacity, 12,000

F

Field Gasoline Corp. (O. C.), 111 W. Seventh St., Los Angeles, Calif.

Pres., O. C. Field
V. P.s, W. G. Metson, J. C. Burks
Sec., N. J. Hale
Treas., R. B. Hale
Gen. Supt., A. L. Henrickson
Pur. Agt., H. E. Everett
Ch. Egr., J. C. Burks
Supt., John Webster, Huntington Beach, Calif.
Plants in California
Capacity, 77,000

Fleming, J. E., Box 606, Titusville, Pa.

Owner, J. E. Fleming
Supt., George Miller, Grand Valley, Warren County, Pa.
Plant in Pennsylvania
Capacity, 500

Forest Chemical Co., Sheffield, Pa.

Pres., Charles R. McNeal
V. P., Charles F. McNeal
Treas. and Gen. Supt., Charles R. McNeal
Plant in Pennsylvania
Capacity, 500 (shut down)

Fullerton Oil Co., R.F.D. 1, Box 456, Fullerton, Calif.

Pres., W. L. Valentine
V. P., W. F. Ball
Sec., V. T. Severns
Treas., W. L. Valentine
Gen. Supt., E. H. Adams
Plant in California
Capacity, 6,000

G

General Petroleum Corp. of California, Higgins Bldg., Los Angeles, Calif.

Pres., A. L. Weil
V. P.s, R. A. Sperry, S. J. Dickey, W. L. McLaine, A. H. DeFriest
Sec., D. W. Woods
Treas., W. Cunningham
Mgr. Gas Dept., R. C. Wheeler
Sales Mgr., A. H. DeFriest
Pur. Agt., R. M. Ketchum
Ch. Chem., G. F. Olsen
Ch. Egr., V. F. Grace
Supts., J. L. McMahon, Santa Fe Springs, Calif.; J. W. Scott, 124 Avalon Blvd., Los Angeles, Calif.; H. W. Havins, Box P-1, Ventura, Calif.; H. S. Donovan, Lebec, Calif.; E. P. Donahue, R.F.D. 1, Box 466, Fullerton, Calif.
Plants in California
Capacity, 275,000

Gilmore Gasoline Plant No. 1, 2423 E. Twenty-eighth St., Los Angeles, Calif.

Pres., E. B. Gilmore
Sec.-Treas., C. S. Beesmyer
Gen. Supt., H. C. Eggleston
Sales Mgr., J. L. Coates
Pur. Agt., L. K. Snyder
Supt., W. Shellshear, 2140 Walnut Ave., Long Beach, Calif.
Plant in California
Capacity, 30,000

Gilmore-Dabney, Inc., 2423 E. Twenty-eighth St., Los Angeles, Calif.

Pres., E. B. Gilmore
Sec.-Treas., C. S. Beesmyer
Gen. Supt., H. C. Eggleston
Sales Mgr., J. L. Coates
Ch. Chem., L. R. Schandoney
Pur. Agt., D. H. F. MacPherson
Ch. Egr., E. Newman
Supt., W. Shellshear 2140 Walnut Ave., Long Beach, Calif.
Plants in California
Capacity, 120,000

Gilliland Refining Co., Gladewater, Tex.

Pres., J. H. Gilliland
Sec.-Treas., A. S. Regan
Sales Mgr., J. H. Campbell
Plants in Texas
Capacity, 10,000 (one plant building)

Gladewater Gasoline Co., Gladewater, Tex.

Pres., C. R. Starnes
Sec.-Treas., E. L. Ames
Gen. Supt., W. G. Manes
Sales Mgr., A. C. Taylor
Plants in Texas
Capacity, 16,000

Gould & Son (Nancy E.), R.F.D. 6, Butler, Pa.

Gen. Supt., F. B. Gould
Plant in Pennsylvania
Capacity, 5

Graham Oil & Gas Co., Graham, Tex.

Pres., Philip Wiseman
V. P.s, H. S. Mudd, L. W. Wickes
Sec.-Treas., G. R. Paull
Gen. Supt., G. R. Paull
Sales Mgr., W. H. Anders
Plant in Texas
Capacity, 8,000

Gregg-Tex Gasoline Corp., Longview, Tex.

Pres., Clark Sample
V. P., Charles Cobb, Jr., Marshall, Tex.
Sec., W. Bruner Smith
Treas., Clark Sample
Gen. Supt., C. E. Wharton
Ch. Egr., E. W. Burt
Plant in Texas
Capacity, 40,000

Grimes (Otha H.), and Roy O. Neal, Atlas Life Bldg., Tulsa, Okla.

Gen. Supt. and Pur. Agt., Roy O. Neal
Treas. and Sales Mgr., Otha H. Grimes
Supt., A. L. Cash, Box 21, Drumright, Okla.
Plant in Oklahoma
Capacity, 6,300

Grimes Gasoline Co. (including plants of C. W. and Otha H. Grimes), 903 Kennedy Bldg., Tulsa, Okla.

Pres., Charles W. Grimes
Sec.-Treas., Otha H. Grimes
Supts., W. O. Kinsey, Okemah, Okla.; Joe Gibson, Weleetka, Okla.; John Elliott, Keystone, Okla.; R. F. Chisolm, Box 231, Mount Pleasant, Mich.
Plants in Oklahoma and Michigan
Capacity, 19,000

Gulf Oil Corp., First National Bank Bldg., Tulsa, Okla.

V. P., Rush Greenslade
Asst. Sec., D. B. Cotterlin
Asst. Treas., C. B. Clothier
Gen. Supt., S. G. Sanderson
Pur. Agt., V. C. Fuller
Plants in Oklahoma
Capacity, 63,300

Gulf Refining Co., Gulf Bldg., Pittsburgh, Pa.

Chm. of Board, J. F. Drake
Pres., F. A. Leovy
V. P., C. R. Minor
Sec., W. J. Guthrie
Treas., J. E. Nelson
Asst. Sec., L. E. Delcuze
Asst. Treas., C. H. Stevens
Plants in Louisiana and Arkansas
Capacity, 22,000

H

Hadden, James B., Sheffield, Pa.

Plant in Pennsylvania
Capacity, 100

Hanlon Gasoline Co., 718 National Bank of Tulsa Bldg., Tulsa, Okla.

Pres., E. I. Hanlon
V. P.s, J. H. Boyle, D. E. Buchanan
Sec., D. R. Bernard
Treas., J. H. Boyle
Sales Mgr., Ray E. Miller
Pur. Agt., J. H. Boyle
Ch. Chem., C. E. Benham
Ch. Egr., C. E. Wharton
Gen. Supt., C. E. Wharton
Supt., A. A. Hardee, Breckenridge, Tex.
Plant in Texas
Capacity, 50,000

Hanlon Gasoline Corp. of Texas, 718 National Bank of Tulsa Bldg., Tulsa, Okla.

Chm. of Bd., E. I. Hanlon
Pres., J. H. Boyle
V. P., D. E. Buchanan
Sec.-Treas., J. H. Boyle
Asst. Sec., V. I. Melvin
Asst. Treas. and Sales Mgr., Ray E. Miller
Gen. Supt., C. E. Wharton
Plant in Texas
Capacity, 75,000

Hapgood & Co. (R. T.), 705 Security Bldg., Charleston, W. Va.

Gen. Supt., D. T. McClure
Pur. Agt., G. E. Tribble
Supts., Wiley Price, Cedar Grove, W. Va.; D. T. McClure, Charleston, W. Va.
Plant in West Virginia
Capacity, 3,500

Harland Oil Co., Wolco, Osage County, Okla.; P. O. Drawer A

Pres., W. W. Vensel
V. P., T. S. Loffland
Sec., H. W. Vensel
Treas., J. M. Loffland
Gen. Supt. and Pur. Agt., H. B. Zahniser
Ch. Egrs. and Supts., D. C. Bohnsack, Wolco; E. B. Vensel, Barnsdall
Plants in Oklahoma
Capacity, 3,000

Haskell Brothers, Pleasantville, Pa.

Supt., William A. Haskell
Plant in Pennsylvania
Capacity, 100

Haskell, Roth & Bayliss, Titusville, Pa.

Supt., Geo. E. Bayliss
Plant in Pennsylvania
Capacity, 400

Henaghan & Hanlon, Inc., Sistersville, W. Va.; 718 National Bank of Tulsa Bldg., Tulsa, Okla.

Pres., E. I. Hanlon
V. P., E. V. Henaghan
Sec., J. V. May
Treas., M. P. Sexton
Asst. Sec.-Treas., J. H. Boyle
Sales Mgr., Ray E. Miller
Gen. Supt., M. P. Sexton
Plant in West Virginia
Capacity, 30,000

Henderson Co., 604 Oliver-Eakle Bldg., Amarillo, Tex.

Pres., F. C. Henderson
V. P., J. Wood Glass, Nowata, Okla.
Sec., F. C. Hall
Treas., E. P. Henderson
Gen. Supt., C. C. Cherry, Box 600, El Dorado, Ark.
Ch. Egr., C. C. Cherry
Sales Mgr. and Pur. Agt., F. C. Hall
Supts., W. H. Rogers and J. C. Terry, El Dorado, Ark.; C. A. Seiple, Sanford, Tex.
Plants in Arkansas and Texas
Capacity, 37,000

Herkness (J. S.), Tenth and Lombard Sts., Philadelphia, Pa.

Pres., J. S. Herkness
Gen. Supt., A. J. Flint
Plant in Louisiana
Capacity, 1,000

Hickey & Rieg, Clarendon, Pa.

Plant in Pennsylvania
Capacity, 300

Home Gas Co., 604 Main St., Clarion, Pa.

Pres., E. H. Banner
V. P., H. H. Arnold
Sec., M. M. Kaufman
Gen. Supt., A. J. McCleary
Pur. Agt., Abe Kaufman
Plant in Pennsylvania

Honolulu Oil Corp., Ltd., 215 Market St., San Francisco, Calif.

Pres., A. C. Dierickx
V. P.s, A. C. Mattei, W. M. Alexander, A. P. Welch, W. P. Roth
Sec., L. A. Cranson
Treas., W. P. Roth
Gen. Supt., R. R. McGuire
Supt., Warren Kraft, Box H, Taft, Calif.
Plants in California
Capacity, 80,000

Hope Construction & Refining Co., 903 Peoples Gas Bldg., Pittsburgh, Pa.

Pres., H. C. Cooper
V. P., L. L. Tonkin
Sec., S. E. W. Burnside
Treas., J. C. Chisler
Gen. Supt., W. B. Gribble
Pur. Agt., F. O. LeRoy
Ch. Egr., L. L. Tonkin
Ch. Chem., R. W. Miller
Plants in West Virginia, Ohio and Pennsylvania
Capacity, 127,300 (41,500 shut down)

Huber (J. M.) Petroleum Co., Box 278, Borger, Tex.

Pres., Walter David
V. P., H. W. Price
Sec.-Treas., H. W. Huber, 460 W. Thirty-fourth St., New York City
Supt., C. B. Rose
Plant in Louisiana
Capacity, 25,000

Huber Corp. (J. M.), Swartz, La.

Pres., H. W. Huber, 460 W. Thirty-fourth St., New York City.
V. P., H. W. Price, Box 278, Borger, Tex.
Sec., Walter David, Box 278, Borger, Tex.
Treas., Walter Huber, 460 W. Thirty-fourth St., New York City
Plant in Louisiana
Capacity, 2,000

Humble Oil & Refining Co., Humble Bldg., Houston, Tex.

Pres., R. L. Blaffer
V. P.s, H. C. Wiess, James Anderson, Wallace E. Pratt, John R. Suman, Judge E. E. Townes
Sec., F. O. Freese
Treas., R. L. Blaffer
Gen. Supt., J. O. Sue
Sales Mgr., B. H. Brown
Pur. Agt., J. A. Rowe
Ch. Egr., Joe Miller
Supts., W. B. Calhoun, Overton, Tex.; I. C. Corbell, Rising Star, Tex.; R. W. Way, Conroe, Tex.
Plants in Texas
Capacity, 114,500

Hunter, Livingston L., Trust, Tidioute, Pa.

Plant in Pennsylvania
Capacity, 300 (shut down)

I

Imperial Oil & Gas Products Co., Union Bank Bldg., Pittsburgh, Pa.
Pres., Joseph Hartman
V. P.s, Paul A. Hartman, Joseph W. Hartman
Sec.-Treas., W. P. McNellie
Sales Mgr. and Pur. Agt., Paul A. Hartman
Supt., J. C. Westfall, P. O. Box 749, El Dorado, Ark.
Plant in Arkansas
Capacity, 500

Indian Territory Illuminating Oil Co., Drawer L, Bartlesville, Okla.
Pres., Burdette Blue
V. P.s, H. O. Caster, F. R. Coates, W. A. Jones, C. H. Caldwell, R. L. Gordon, A. V. Hoenig and R. L. Morton
Sec., E. B. Emenhiser
Treas., C. H. Caldwell
Gen. Supt., T. A. Stevens
Sales Mgr., G. V. N. Yates
Ch. Chem., Frank Allen
Pur. Agt., C. M. Taylor
Div. Mgr., D. B. Dow, Oklahoma City, Okla.
Supts., R. M. Campbell, Box 4577, Capitol Hill, Oklahoma City, Okla.; C. D. McReynolds, Box 4577, Capitol Hill, Oklahoma City, Okla.; H. P. Wingo, Box 4577, Capitol Hill, Oklahoma City, Okla.; James Porter, Oklahoma City, Okla.
Plants in Oklahoma
Capacity, 150,000

International Oil & Gas Co., Washington, Pa.
Plant in Illinois
Capacity, 2,000

Italo Petroleum Corp. of America, 391 Sutter St., San Francisco, Calif.
Pres., J. Seeley
V. P.s, J. W. Pauson, A. J. Scampini
Sec., Joseph Pensa
Treas., Hugh K. McKevitt
Gen. Supt. and Pur. Agt., R. A. Earle
Plant in California
Capacity, 300

J

Jackson, Fred W., Chicora, Pa.
Plant in Pennsylvania
Capacity, 360

Jennings Brothers Co. (E. H.), 608 Columbia Bldg., Pittsburgh, Pa.
Pres., R. G. Jennings
V. P., E. D. Jennings
Sec., E. H. Jennings
Treas., R. G. Jennings
Plants in Pennsylvania
Capacity, 2,350

K

Kanawha Oil Co., 2009 Clark Bldg., Pittsburgh, Pa.
Pres. and Sec., E. D. Jennings
V. P. and Treas., R. G. Jennings
Asst. Sec., J. G. Vollmer
Supt., A. H. Reardon, Jacksonburg, W. Va.
Plants in West Virginia
Capacity, 1,500

Kansas Gasoline Co., 1413 Hunt Bldg., Tulsa, Okla.
Pres., J. A. Hull
V. P., R. C. Riley
Sec., O. J. McCann
Treas. and Pur. Agt., P. F. Cole
Supt., Albert Wilson, Box 1007, Winfield, Kans.
Plant in Kansas
Capacity, 5,000

Kansas Power & Light Co., 808 Kansas Ave., Topeka, Kans.
Pres., D. E. Ackers
V. P., C. E. Brock, Salina, Kans.
Sec.-Treas., H. E. Johnson, 710 N. Twelfth Blvd., St. Louis, Mo.
Plant Supt., H. R. Otto, Salina, Kans.
Pur. Agt., I. S. Stewart
Supts., Wayne Austin, McPherson, Kans.; R. B. McLaughlin, Medicine Lodge, Kans.; W. G. Marsh, Calista, Kans.; Geo. Herrick, Abilene, Kans.
Plants in Kansas
Capacity, 20,000

Kentucky Pipe Line Co., 311 W. Chestnut St., Louisville, Ky.
Pres., T. B. Wilson
V. P.s, J. J. McKenna, A. W. Lee, R. Montgomery
Sec., F. J. Preiffer
Treas., J. J. McKenna
Gen. Supt. and Sales Mgr., J. A. Yunker
Pur. Agt., G. Davies
Supt., H. D. Robb, Winchester, Ky.
Plant in Kentucky
Capacity, 2,600

Kewanee Oil & Gas Co., 2317 Fidelity-Philadelphia Trust Bldg., Philadelphia, Pa.
Pres., Wm. M. Potts
Sec.-Treas., R. B. Ashenfelter
Gen. Mgr., F. B. Howland
Supt., T. B. Steele, P. O. Box 232, Robinson, Ill.
Plants in Illinois
Capacity, 485

L

LaSalle Petroleum Co., 612 Wright Bldg., Tulsa, Okla.
Receivers, W. J. Schnur and Phil D. Williams
Supt., Phil D. Williams, P. O. Box 576, Burkburnett, Tex.
Plant in Texas
Capacity, 8,000 (shut down)

Lisbon Gasoline Co., Inc., 229 Ricou-Brewster Bldg., Shreveport, La.
Pres., O. J. Dykes
V. P., Geo. W. James
Sec., T. J. Heard
Treas., D. R. Muirhead
Gen. Supt., M. H. Trout, Box 464, Henderson, Tex.
Plants in Texas
Capacity, 30,000

Lomita Gasoline Co., Jergins Trust Bldg., Long Beach, Calif.
Pres., C. M. Cotton
V. P.s, A. T. Jergins, J. A. Campbell
Sec.-Treas., F. S. Wade
Gen. Supt., L. V. Cassady
Supts., M. S. Hubbell, Route 2, Box 22, Bakersfield, Calif.; J. H. Clark, Box 851, Long Beach, Calif.
Plants in California
Capacity, 60,000

Lone Star Gas Co., 1915 Wood St., Dallas, Tex.
Pres., L. B. Denning
V. P.s, R. A. Crawford, F. L. Chase
Sec.-Treas., D. L. Cobb
Gen. Supt., E. F. Schmidt
Sales Mgr., A. F. Garrett
Ch. Egr., J. F. Foster
Pur. Agt., B. R. Newbery
Supts., F. H. Townsend, Gordon, Tex.; J. E. Johnson, Route 1, Cisco, Tex.; H. C. Wells, Hollis, Okla.; Joe M. Phillips, Petrolia, Tex.; G. H. King, Box 488, Ranger, Tex.; J. M. Kindle, Trinidad, Tex.
Plants in Texas
Capacity, 93,000

Lone Star Gasoline Co., 1915 Wood St., Dallas, Tex.
Pres., L. B. Denning
V. P.s, R. A. Crawford, F. L. Chase
Sec.-Treas., D. L. Cobb
Gen. Supt., J. R. Jarvis
Sales Mgr., A. F. Garrett
Pur. Agt., B. R. Newbery
Ch. Egr., J. L. Foster
Supts., Harry Wheeldon, P. O. Box 788, Ranger, Tex.; J. A. Bates, P. O. Box 1452, Breckenridge, Tex.
Plants in Texas
Capacity, 102,500

Los Nietos Producing & Refining Co., Ltd., 714 W. Tenth St., Los Angeles, Calif.
Pres., C. E. Doheny
V. P.s, C. W. Smith, R. S. Lytle, R. M. Sands
Sec., G. M. Johnson, Jr.
Treas., Olin Wellborn, III
Sales Mgr., R. S. Lytle
Pur. Agt., W. A. Pierce
Ch. Egr., R. A. Silent
Supt., George Thompson, Avenal, Calif.
Plant in California
Capacity, 100,000

Louisiana Gas & Fuel Co., City Bank Bldg., Shreveport, La.
Plants in Louisiana
Capacity, 40,000

Louisiana Iron & Supply Co., Shreveport, La.
Plant in Arkansas
Capacity, 5,000

Louisville Gas & Electric Co., 311 West Chestnut St., Louisville, Ky.
Pres., T. B. Wilson
V. P., A. W. Lee
Sec., J. J. McKenna
Gen. Supt., J. A. Yunker
Pur. Agt., G. Davies
Supt., H. D. Robb, Winchester, Ky.
Plant in Kentucky
Capacity, 2,500

M

Magnolia Petroleum Co., Magnolia Bldg., Dallas, Tex.
Pres., D. A. Little
V. P.s, L. S. Sinclair, W. H. Francis, M. J. McLaughlin, C. L. Gladden, F. M. Lege, Jr., T. J. Fitch and J. C. Stephens
Sec., G. L. Tate
Treas., W. L. Holmes
Gen. Supt., D. E. West
Sales Mgr., Geo. Miller
Ch. Chem., N. O. Carman
Ch. Egr., R. D. Hanley
Pur. Agt., J. P. David
Supts., W. B. January, Electra, Tex.; O. B. Zeek, Box 308, Electra, Tex.; V. L. Dickinson, Box 1148, Pampa, Tex.; J. A. Upton, Olden, Tex.; Guy E. Cox, Box 77, St. Louis, Okla.; J. F. Lewis, Healdton, Okla.; M. C. Aker, Eldorado, Ark.
Plants in Texas, Arkansas and Oklahoma
Capacity, 85,600

Mahutska Oil Co., Robinson State Bank Bldg., Robinson, Ill.
Pres., Alex U. McCandless
V. P., L. G. Niehoff
Sec., John A. Byerly
Treas., L. B. Niehoff
Gen. Supt., Frank B. Barnes
Pur. Agt., Alex U. McCandless and Frank B. Barnes
Supts., S. H. Correll, R.F.D. 3, Robinson, Ill.; Fred Boyd, R.F.D., Oblong, Ill.
Plants in Illinois
Capacity, 2,000

Manhattan Gasoline Co., Refugio, Tex.
Gen. Supt., R. S. Wyrick
Plant Supt., D. A. Price
Plant in Texas
Capacity, 7,000 (building)

Marathon Oil Co., Thompson Bldg., Tulsa, Okla.
Pres., W. W. Fleming
V. P.s, J. L. Cook, M. E. Wagner and L. B. McCammon
Sec., W. J. Wilson
Treas., J. L. Cook
Gen. Supts., W. E. Smith, Tex. Div., Eliasville, Tex.; G. M. Cook, Okla. Div., Bristow, Okla.
Supts., L. L. Pittman and Homer Nash, Box 277, Eliasville, Tex.; G. C. Ellington, Box 780, Bristow, Okla.
Plants in Oklahoma and Texas.
Capacity, 25,000.

Marr Natural Gasoline Co., 505 Peoples National Bank Bldg., Tyler, Tex.
Pres., Jack Marr
V.P.-Gen. Supt., W. O. Stowell
Sec.-Treas., F. J. Morris
Sales Mgr., F. J. Morris
Pur. Agt.-Ch. Egr., W. O. Stowell
Plant in Texas.
Capacity, 2,000

Mars Co., The, 306-8 Seneca St., Oil City, Pa.
Pres., G. E. Welker
V. P., A. C. Burwell
Sec.-Treas., H S. Rose
Sales Mgr., C. P. Garvey
Pur. Agt., M. J. Conner
Ch. Chem., J. R. Fay
Supts., W. E. Huggler, Van, Pa.; W. C. McDonald, Hampton St., Oil City, Pa.; J. O. Clark, Lewis Run, Pa.; E. L. Betz, Endeavor, Pa.; N. C. Gifford, Clarion, Pa.
Plants in Pennsylvania
Capacity, 21,300

Masoneal Gasoline Co., Kennedy Bldg., Tulsa, Okla.
Pres., D. B. Mason
V. P., E. L. Thompson
Sec., D. B. Mason, Jr.
Gen. Supt., O. Reeves
Supt., O. Reeves, Box 103, Osage, Okla.
Plant in Oklahoma
Capacity, 1,500

Master and Hess, Fern, Pa.
Partnership
Plant in Pennsylvania
Capacity, 100

McBride, W. C., Inc., 2101 Missouri Pacific Bldg., St. Louis, Mo.
Pres., B. O. Mahaffey
V. P. and Gen. Mgr., C. F. Buchner
Sec.-Treas., E. R. Christman
Gen. Supt., R. E. Hilpert
Supt., J. B. Chrisman, 604 Wright Bldg., Tulsa, Okla.
Plant in Oklahoma
Capacity, 1,500

Melrose Oil & Gas Co., F. & P. Bank Bldg., Sistersville, W. Va.
Pres., Neal K. Wilson, Cuba, N. Y.
V. P., John P. Flynn
Sec., Louis N. Thomas, Fort Worth, Tex.
Treas., Neal K. Wilson
Gen. Supt., R. U. Adams, Sistersville, W. Va.
Supts., Claude H. Gorby, Sistersville, W. Va.; S. M. Tallurace, Middlebourne, W. Va.
Plants in West Virginia
Capacity, 50

Mideo Oil Corp., Box 2085, Tulsa, Okla.
Pres., C. C. Toomey
V. P., Burton French
Sec.-Treas., Burton French
Asst. Sec.-Treas., Grace A. Wade
Supts., C. L. Quick, J. E. Burgess
Plants in Oklahoma
Shut down

Mid-Continent Petroleum Corp., Cosden Bldg., Tulsa, Okla.
Pres., Jacob France
V. P., F. B. Koontz
Asst. Sec., A. D. Kneale
Treas., Charles Klein
Gen. Supt., F. E. Kearney
Pur. Agt., C. A. Prichard
Ch. Egr., C. S. Heisler
Supts., F. C. Bach, Box 85-A, R.F.D. 3, Bristow, Okla.; Ed. Burgess, Box 97, Leonard, Okla.; R. H. Corbin, Box 387, Morris, Okla.; J. A. Blakemore, Box 788, Cromwell, Okla.; C. C. Wolford, Box 11, Stroud, Okla.
Plants in Oklahoma
Capacity, 91,000

Midland Gasoline Co., Box 338, Conroe, Tex.
Pres.-Gen. Mgr., Henry M. Brown, Houston, Tex.
V. P.-Sec., H. T. McGown, Fort Worth, Tex.
Treas., H. M. Brown, Houston, Tex.

Supt., F. M. Neely, Box 338, Conroe, Tex.
Pur. Agt., F. D. Fiegel
Plant in Texas
Capacity, 10,000

Miller & Marshall, Karns City, Pa.

Plant in Pennsylvania
Capacity, 25

Mohawk Petroleum Co., 806 Financial Center Bldg., San Francisco, Calif.

Pres., Alfred L. Marsten
V. P.s, Alfred L. Marsten, Jr., and Edwin V. McKenzie
Sec.-Treas., J. P. Halford
Gen. Supt., J. A. Robinson
Sales Mgr., Carl Stevenson
Pur. Agt., V. K. Douglas
Supt., J. A. Robinson, Box 1476, Bakersville, Calif.
Plant in California
Capacity, 10,000

Montana Power Gas Co., Electric Bldg., Butte, Mont.

V. P., F. W. Bird
Treas., J. R. Thomas
Pur. Agt., W. T. Jackson
Ch. Egr., H. H. Cochrane
Supt., E. M. Parkin, Cut Bank, Mont.
Plant in Montana
Capacity, 9,000

Montgomery, J. B., McKees Rocks, Pa.

Sec., Bert Noble
Treas., S. H. Morgan
Sales Mgr., Bert Noble
Pur. Agt., Bert Noble
Ch. Egr., A. A. Bock
Plant in Pennsylvania
Capacity, 100

Moore, Way & Harrison, Titusville, Pa.

Plant in Pennsylvania
Capacity, 150

Mountain States Oil Corp., Barela, Colo.

Plant in Colorado
Capacity, 6,000

Myers Bros. & Hazzard, Tidioute, Pa.

Plant in Pennsylvania
Capacity, 100

N

National Products Co., 1510 Commonwealth Bldg., Pittsburgh, Pa.

Pres., F. W. Finley
Sec.-Treas., M. E. Eberle
Gen. Supt., H. A. Frame
Supts., [illegible], Cleveland, Okla.; J. G. Young, Oilton, Okla.; Ralph Moore, Slick, Okla.
Plants in Oklahoma
Capacity, 5,400

Natural Gasoline Corp., National Bank of Tulsa Bldg., Tulsa, Okla.

Pres., W. K. Warren
V. P., J. A. La Fortune
Sec., H. E. Felt
Treas., A. J. Murphy
Gen. Supt., M. E. Mockley
Sales Mgr., J. A. La Fortune
Ch. Chem., S. S. Allender
Pur. Agt., A. J. Murphy
Ch. Egr., H. W. Harts
Supts., L. D. Parker, Box 37, Harjo, Okla.; H. W. Williams, Box 686, Healdton, Okla.; I. N. Journeycake, Rt. 8, Box 243, Oklahoma City, Okla.; F. E. Thompson, Drawer "C," Fry, Tex.; J. W. Kearney, Box 67, Monument, N. Mex.
Plants in Oklahoma, Kansas, Texas and New Mexico
Capacity, 162,000

Neal Gasoline Co., 507 Atlas Life Bldg., Tulsa, Okla.

Pres., Roy O. Neal
Treas., H. B. Neal
Gen. Supt. and Pur. Agt., Roy O. Neal
Ch. Egr., Roy O. Neal
Supts., L. W. Blair, Box 186, Osage, Okla.; F. Hamilton, Copan, Okla.
Plants in Oklahoma
Capacity, 5,200 (1,200 shut down)

New York Petroleum Co., 402 Avery St., Parkersburg, W. Va.

V. P., H. L. Stout
Sec.-Treas., B. Ferrell
Gen. Supt., John L. Davis
Plants in West Virginia
Capacity, 250

Nine Oaks Gasoline Corp., Box 628, Electra, Tex.

Pres., J. H. Massie, Wichita Falls, Tex.
V. P., Roy L. Riner, Waxahachie, Tex.
Sec.-Treas., E. B. Prince, Waxahachie, Tex.
Gen. Supt., H. T. Bolen, Gladewater, Tex.
Sales Mgr.-Pur. Agt., H. M. Prince, Gladewater, Tex.
Plant in Texas
Capacity, 1,000

Nolan & Lamberton, 212 South Olympia St., Tulsa, Okla.

Partnership, Nolan Oil & Gas Co., Box 558, Chanute, Kans.; R. L. Lamberton, Box 331, Franklin, Pa.; W. J. Lamberton Estate, Tulsa, Okla.
Supt., W. E. Russell, Route 4, Oblong, Ill.
Plant in Illinois
Capacity, 100

North Penn Gas Co., 103 Mill St., Port Allegany, Pa.

Pres., C. I. Crippen, 30 Broad St., New York City
V. P., J. H. Isherwood, Port Allegany, Pa.
Sec., J. C. Forsyth, 30 Broad St., New York City
Treas., C. R. Beddows, 30 Broad St., New York City
Plant in Pennsylvania
Capacity, 600 (shut down)

Norwalk Company, 634 So. Spring St., Los Angeles, Calif.

Pres., Lionel T. Barneson
V. P.s, H. J. Barneson, J. L. Barneson
Sec., W. E. Kropp
Gen. Mgr., L. L. Aubert
Pur. Agt., John C. Penn
Supts., K. E. Grigsby, Route 3, Box 255, Santa Fe Springs, Calif.; Jack Brennan, Box 688, Maricopa, Calif.
Plants in California
Capacity, 70,000

O

Ohio Oil Co., 539 S. Main St., Findlay, Ohio

Pres., O. D. Donnell
V. P.s, C. L. Fleming, John McFadyen, W. W. Fleming, G. E. McCullough
Sec., E. B. Redpath
Treas., F. A. Billstone
Supts., E. B. Charlton, Shreveport, La.; J. R. Thorpe, Robinson, Ill.; Burr Farr, Casper, Wyo.; George Sowards, Casper, Wyo.; H. T. Henton, Casper, Wyo.; Herman Brunt, Casper, Wyo.; S. A. Smith, Los Angeles, Calif.
Plants in Louisiana, Wyoming, Illinois and California
Capacity, 70,131 (7,760 shut down)

Ohio Producing & Refining Co., East Ohio Gas Bldg., Cleveland, Ohio

Pres., John J. McMahon
V. P., W. G. Hagan
Sec.-Treas., W. G. Rogers
Gen. Supt., J. J. Schmidt
Pur. Agt., A. J. Hattwich
Ch. Chem. and Egr., C. F. Turner
Plant in Ohio
Capacity, 6,000

Oil & Gas Co., 318½ Juliana St., Parkersburg, W. Va.

Pres., Reese Blizzard
V. P., A. D. Ireland
Sec., Ross Wells
Treas., T. G. Reitz
Gen. Supt. and Pur. Agt., Ira Williams, St. Marys, W. Va.
Supt., W. O. Wells, Harrisville, W. Va.
Plant in West Virginia
Capacity, 250

Oil State Gasoline Co., 424 S. Cheyenne, Tulsa, Okla.

Pres., O. R. Howard
Plant in Oklahoma
Capacity, 2,500

Oklahoma Gasoline Plants, Inc., Box 896, Sapulpa, Okla.

Pres., L. B. Jackson
V. P., E. E. Thompson
Sec., Wm. Maurer
Treas., R. J. Ranck
Gen. Supt. and Pur. Agt., E. E. Thompson, Box 707, Drumright, Okla.
Ch. Egr., G. L. Newman
Plant in Oklahoma
Capacity, 10,000

Oklahoma Utilities Co., 123½ W. Seventh St., Bristow, Okla.

V. P., R. W. Booze
Asst. Sec. and Treas., J. A. Staples
Gas Supt., R. C. Poage
Pur. Agt., V. L. Wilson
Supt., A. C. Wright, Box 68, Bristow, Okla.
Plant in Oklahoma
Capacity, 5,000

Owens, Libby-Owens, Gas Dept., Box 1375, Charleston, W. Va.

Gen. Mgr., W. E. Spalding
Gen. Supt., F. F. Ketchum
Ch. Egr., Wm. B. Strong
Pur. Agt., L. L. Kohlbecker
Supt., F. F. Ketchum, Owens., W. Va.
Plant in West Virginia
Capacity, 10,000

P

Pacific Western Oil Co., 1060 Subway Terminal, Los Angeles, Calif.

Pres., H. P. Grimm
V. P., H. M. Macomber
Sec., D. T. Staples
Treas., W. G. Gibson
Gen. Supt., Ben A. Koehler
Pur. Agt., C. A. Jackson
Ch. Egr., W. F. Crane
Supts., B. S. Anderson, Ventura, Calif.; Byron Norton, Goleta, Calif.
Plants in California
Capacity, 30,000

Pala Oil Co., Inc., 327 Atkins Ave., Shreveport, La.

Pres., F. L. Wiegand
V. P., J. M. Post
Sec.-Treas., T. M. Hope
Gen. Supt., C. P. Hanlen
Plant in Louisiana
Capacity, 200

Parade Gasoline Co., Inc., 421 Commercial National Bank Bldg., Shreveport, La.

Pres., J. B. Atkins
V. P.s, H. L. Hunt, Tyler, Tex.; D. P. Hamilton
Sec.-Treas., Roy Lee, Tyler, Tex.
Asst. Sec. and Treas., R. A. Worley
Gen. Supt., E. L. Clover, Overton, Tex.
Sales Mgr. and Pur. Agt., J. B. Atkins
Ch. Chem., R. W. Newell, Overton, Tex.
Ch. Egr., B. G. Harbison, Overton, Tex.
Supt., E. L. Clover, Box 528, Overton, Tex.
Plant in Texas
Capacity, 45,000

Pelican Oil & Gasoline Co., Shreveport, La.

Plant in Louisiana
Building

Pennsylvania Oil Co., Sheffield, Pa.

Plant in Pennsylvania
Capacity, 10,000

Pep Gasoline Co., 6247 Brookside Blvd., Kansas City, Kans.

Pres., J. O. Bruen
Treas. and Gen. Mgr., E. W. Bruen
Plant in Kansas
Capacity, 1,800

Peppers Gasoline Co., Box 858, Enid, Okla.

Pres., Chas. C. Pepper
Sec., H. H. Champlin
Supts., J. C. McConnico, Box 86, Oklahoma City, Okla.; O. C. Sullivan, Covington, Okla.
Plant in Oklahoma
Capacity, 14,000

Phillips Petroleum Co., Phillips Bldg., Bartlesville, Okla.

Pres., Frank Phillips
V. P.s, J. H. Kane, W. N. Davis, H. E. Koopman, J. M. Sands, H. A. Trower, C. P. Dimit, F. E. Rice, C. R. Musgrave, G. G. Oberfell, R. H. Lynn and M. P. Youker
Sec., B. F. Stradley
Treas., K. S. Adams
Gen. Mgr. of Gaso. Dept., George P. Bunn
V. P. in Chg. Pur., H. E. Koopman
Sales Mgr., A. M. Hughes
Ch. Egr., A. H. Riney
District Supts., Oklahoma, E. L. Utsinger, Bartlesville, Okla.; Western, A. W. Paris, Box 666, Crane, Tex.; Panhandle, Rex McRoy, Box 358, Whittenburg, Tex.; Pampa Group, W. R. Barrett, Route 2, Pampa, Tex.; Central Texas, L. B. Wood, Box 1332, Breckenridge, Tex.
Supts., J. P. Weatherall, Box 4-A, Route 2, Kaw, Okla.; L. V. Miller, Box 88, Pershing, Okla.; R. L. Ford, Box 517, Fairfax, Okla.; J. H. Oliver, Okmulgee, Okla.; R. K. McConnell, Box 989, Oklahoma City, Okla.; L. P. Clarke, Drawer B, Snomac, Okla.; W. W. Ford, Box 37, Bryant, Okla.; R. L. Stewart, Box 606, Wewoka, Okla.; C. E. Thomas, Box 967, Wewoka, Okla.; Carl Fisher, Box 666, Crane, Tex.; W. D. Kirkpatrick, Box 9, Judkins, Tex.; A. C. Brock, Drawer PP, Hobbs, N. Mex.; C. A. Thorne, Box 358, Whittenburg, Tex.; O. J. Brazil, Box 358, Whittenburg, Tex.; Walter Beets, Box 358, Whittenburg, Tex.; A. F. Lasater, Box 358, Whittenburg, Tex.; E. R. Martin, Box 358, Whittenburg, Tex.; B. V. Wallis, Box 358, Whittenburg, Tex.; H. M. Rapp, Box 358, Whittenburg, Tex.; C. Heironimus, Route 2, Pampa, Tex.; W. C. Boatwright, Route 2, Pampa, Tex.; Homer Gibson, Route 2, Pampa, Tex.; E. Traywick, Route 2, Pampa, Tex.; H. F. Magerkurth, Route 2, Pampa, Tex.; F. B. Joyce, Box 507, Pioneer, Tex.; J. F. Steed, Frankell, Tex.; R. C. Mason, Ibex, Tex.; J. M. Williams, South Bend, Tex.; J. F. Waters, Eliasville, Tex.; J. K. Gibson, Box 177, Pasadena, Tex.; Hugh Miller, Borger, Tex.; W. R. Dickens, Box 989, Oklahoma City, Okla.; R. D. Evans, Okmulgee, Okla.
Plants in Oklahoma, Texas and New Mexico
Capacity, 1,134,500 (25,000 shut down)

Pittsburgh Oil & Gas Co., 1005 Farmers Bank Bldg., Pittsburgh, Pa.

Pres., E. B. Reeser, Box 2091, Tulsa, Okla.
V. P. and Sec., Jas. A. Dunn, 120 Broadway, New York City
Treas., John T. Furlong
Pur. Agt. and Gen. Supt., H. R. Jackson.
Supts., C. R. Jeannerat, Third St., Clarion, Pa.; C. A. Cousten, Middlebourne, W. Va.; Arthur Cousten, Macfarlan, W. Va.; V. P. Stover, Sycamore Valley, Ohio; R. A. Bookman, Schley, Ohio
Plants in Pennsylvania, West Virginia and Ohio
Capacity, 2,850 (1,500 shut down)

Porter Brothers, Sarah Furnace, Pa.
Plant in Pennsylvania
Capacity, 100

Powers, M. F., 624 So. Cheyenne Ave., Tulsa, Okla.
Owner and Gen. Supt., M. F. Powers
Sales Mgr., E. C. Sager
Pur. Agt., F. George Heinze
Supt., Lester Flanagan, Depew, Okla.
Plant in Oklahoma
Capacity, 3,500

Powers & Quinlan, 624 So. Cheyenne Ave., Tulsa, Okla.
Partnership, M. F. Powers and Felix Quinlan, Jr.
Gen. Supt., M. F. Powers
Sales Mgr., E. C. Sager
Pur. Agt., F. George Heinze
Supt., Felix Quinlan, Jr., Box 696, Beggs, Okla.
Plants in Oklahoma
Capacity, 2,100

President Oil Co., Emlenton, Pa.
Pres., H. J. Crawford
V. P., T. P. Gregory
Sec.-Treas., J. E. Taylor
Gen. Supt., J. S. Beals
Supts., F. G. McCord, Emlenton, Pa.; S. Smith, Venus, Pa.; Lloyd L. Henry, Parker, Pa.
Plants in Pennsylvania
Capacity, 370

Preston Oil Co., Kanawha Valley Bldg., Charleston, W. Va.
Pres., Chas. A. Munroe
V. P.s, James L. Harrop, Chas. F. Huff., Ralph N. Parks
Sec., Leith V. Watkins
Treas., N. E. Shupe
Sales Mgr., R. M. Clark
Ch. Chem., R. A. Schuster
Supts., Lee Meyers, R.F.D. No. 2, Summerfield, Ohio; J. W. Dumbaugh, Pavonia, Ohio; W. P. Caley, Sugar Grove, Ohio; L. A. Chrisman, Homer, Ohio; J. J. Woodruff, Box 304, Medina, Ohio
Plants in Ohio
Capacity, 46,000

Producers Gas Co., 301 First National Bank Bldg., Olean, N. Y.
Pres., E. H. Wright
V. P., J. B. Bradley
Sec.-Treas., F. W. Herron
Gen. Supt., E. M. Johnson
Supt., Clark Hughes, Little Genesee, N. Y.
Plant in New York (shut down)

Pryor, Berry, Petrolia, Pa.
Plant in Pennsylvania
Capacity, 25

Pure Oil Co., 35 East Wacker Drive, Chicago, Ill.
Pres.,H. M. Dawes
V. P.s, R. W. McIlvain, C. B. Watson, N. H. Weber, F. S. Heath
V. P. and Sec., L. S. Wescoat
V. P. and Treas., Rawleigh Warner
Pur. Agt., G. L. Parsons
Ch. Chem., C. R. Wagner
Supts., W. L. McCarty, Tulsa, Okla.; J. H. Prater, Box 224, Van, Tex.; Jack Swift, Dawes, W. Va.
Plants in Oklahoma, West Virginia and Texas
Capacity, 33,250

R

Rainbow Gasoline Corp., 818 McBirney Bldg., Tulsa, Okla.
Pres., D. S. Brooks
V. P., M. D. Brooks
Sec., F. C. Hall
Treas., F. C. Henderson
Sales Mgr. and Pur. Agt., F. C. Hall
Gen. Supt., C. C. Cherry
Ch. Egr., O. H. Stanbrough
Plant in Arkansas
Capacity, 20,000

Ramage, S. Y., First National Bank Bldg., Oil City, Pa.
Supts., Fred McDaniels, Reno, Pa.; F. J. Swanson, R.F.D., Tidioute, Pa.; Clarence Dearth, Bens Run, W. Va.; H. C. Dearth, Route No. 4, Franklin, Pa.
Plants in Pennsylvania and West Virginia
Capacity, 200

Red Brush Oil Co., 10 Walnut St., Tidioute, Pa.
Sec.-Treas., C. E. Gesin
Supt., C. E. Gesin, Tidioute, Pa.
Plant in Pennsylvania
Capacity, 40

Reno Oil Co., Wells Bldg., Sistersville, W. Va.
Pres., J. P. Flynn
Sec.-Treas., W. R. Reitz
Gen. Supt. and Pur. Agt., J. P. Flynn
Supts., A. C. Mercer, Ellenboro, W. Va.; John McGuirk, R.F.D., Harrisville, W. Va.; Otto Woodburn and S. G. Hissam, R.F.D., Sistersville, W. Va.; C. E. Eddy, Wade, Ohio
Plants in West Virginia and Ohio
Capacity, 312

Reserve Gas Co., 545 Wm. Penn Way, Pittsburgh, Pa.
Pres., J. F. Robinson
V. P., T. B. Gregory
Sec., S. E. W. Burnside
Treas., J. C. Chisler
Gen. Supt., W. B. Dribble
Pur. Agt., F. O. LeRoy
Ch. Chem., R. W. Miller
Ch. Egr., L. L. Tonkin
Plant in West Virginia
Capacity, 20,000

Reservoir Hill Gasoline Co., 815 Subway Terminal Bldg., Los Angeles, Calif.
Pres., Chas. S. Jones
V. P.s, Frank Morgan, H. E. Britzman
Sec.-Treas., M. R. Gross
Supt., R. E. Wells
Pur. Agt., H. H. Kelly
Plant in California
Capacity, 30,000

Rice Ranch Oil Co., 262 So. Los Angeles St., Los Angeles, Calif.
Pres., G. W. Lichtenberger
V. P.s, Alfred J. Bayer and P. H. O'Neil
Sec., H. G. Phillips
Gen. Supt., Edgar Craig
Plant in California
Capacity, 6,000

Riddle Farm Oil Co., Karns City, Pa.
Plant in Pennsylvania
Capacity, 50

Rio Grande Oil Co., 855 Subway Terminal Bldg., Los Angeles, Calif.
Pres., C. S. Jones
V. P.s, Frank A. Morgan, H. E. Britzman
Sec.-Treas., M. R. Gross
Supt., R. E. Wells
Pur. Agt., H. H. Kelly
Plant in California
Capacity, 30,000 (shut down)

Roeser & Pendleton, Inc., 613 Fort Worth Club Bldg., Fort Worth, Tex.
Pres., Charles F. Roeser
V. P.s, T. T. Pendleton, M. R. Young
Sec., A. M. Brackett
Treas., M. R. Young
Gen. Supt., Marshall R. Young
Ch. Chem., R. H. Locker
Ch. Egr., G. P. Crutchfield
Plant in Texas
Capacity, 30,000

Rogers (R. G.), Oil Co., Oblong, Ill.
Plant in Illinois
Capacity, 35

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Sabine Valley Gasoline Co., Inc., Shreveport, La.
Pres. and Treas., H. R. Dickerson
V. P., L. W. Dickerson
Sec., W. D. Wilson
Ch. Egr., H. H. Beeson
Supt., D. E. Farris, Longview, Tex.
Plant in Texas
Capacity, 42,000

St. Helens Petroleum Co., Ltd., 1031 S. Broadway, Los Angeles, Calif.
Chm. of Bd., C. B. Stocken
Sec., Herbert Towers
Gen. Supt., Charles Drader
Sales Mgr., M. F. Dolan
Pur. Agt., H. C. Drader
Ch. Chem., C. W. Spark
Ch. Egr., C. Z. Webb
Supts., Geo. C. Sproule, Box 248, Montebello, Calif.; J. A. Stotts, Route 1, Box 182, Bakersfield, Calif.
Plants in California
Capacity, 2,500 (shut down)

Sand Hill Lease, Tidioute, Pa.
Partnership
Supt., Alfred Peterson, R.F.D. 2, Tidioute, Pa.
Plant in Pennsylvania
Capacity, 100

Shamrock Oil & Gas Co., Amarillo Bldg., Amarillo, Tex.
Pres., J. J. Sheerin
V. P.s, H. C. Fownes, II, Robert T. Wilson
Sec., J. B. Orr
Gen. Supt., C. L. Todd
Sales Mgr., N. E. Schneider
Treas., H. C. Fownes, II
Gas Egr., Earle N. Armstrong, Box 1471, Amarillo, Tex.
Supts., E. T. Broughton, Amarillo, Tex.; H. H. Saunders, Sunray, Tex.
Plants in Texas
Capacity, 17,000

Shell Oil Co., 200 Bush St., San Francisco, Calif.
Pres., C. Legh-Jones
Sec., A. R. Bradley
Treas., John Lander
Pur. Agt., J. S. Story
Plant in California
Capacity, 256,000

Shell Petroleum Corp., Shell Bldg., St. Louis, Mo.
Pres., Alexander Fraser
V. P.s, H. H. Anderson, J. W. Watson, Dr. W. Van Holst Pellekaan, T. E. Swigart, R. P. Bascom, A. E. Lacomble, P. E. Lakin, H. Bloemgarten and A. J. Galloway
Sec., C. S. Gentry
Treas., J. W. Watson
Gen. Supt., S. S. Smith
Asst. Supt., R. E. Baker
Sales Mgr., P. E. Lakin
Pur. Agt., C. B. Singleton
Ch. Egr., S. Peterson
Supts., J. L. May, Iowa, La.; C. E. Smith, Hobbs, N. Mex.; P. E. Foster, Norco, La.; R. C. Roberts, Box 452, Arkansas City, Kans.
Plant Foremen, L. L. Lamar, Avant, Okla.; S. V. Young, Hewitt, Okla.; C. E. Haines, Marshall, Okla.; E. F. Thoes, Maud, Okla.; M. R. Church, Pampa, Tex.; C. J. Goldston, Pampa, Tex.; S. W. Craig, Marland, Okla.; R. H. Medler, Drumright, Okla.
Plants in Oklahoma, Kansas, Texas, New Mexico and Louisiana
Capacity, 92,655

Signal Hill Gasoline Co., 555 South Flower St., Los Angeles, Calif.
Pres., R. W. Walsh
V. P.s, A. M. Kelly, J. S. Wallace, R. D. Montgomery
Sec.-Treas., R. B. Wilson
Gen. Mgr., H. R. Linhoff
Ch. Chem., M. L. Arnold
Pur. Agt., B. J. Mahaffy
Supts., M. D. Martin, Box K, Taft, Calif.; C. E. Gotterba, Bin "W," Long Beach, Calif.
Plants in California
Capacity, 82,000 (45,000 shut down)

Signal Oil Co., 811 West Seventh St., Los Angeles, Calif.
Pres., S. B. Mosher
V. P.s, R. H. Green, O. W. March
Sec., H. J. March
Treas., O. W. March
Gen. Supt., R. W. Heath
Sales Mgr., O. W. March
Pur. Agt., J. F. Thies
Ch. Egr., G. L. Young
Supts., J. G. Hill, Long Beach, Calif.; A. Kittleberger, Long Beach, Calif.
Plants in California and Texas
Capacity, 145,000 (65,000 shut down)

Silurian Oil Co., Missouri Pacific Bldg., St. Louis, Mo.
Pres., B. O. Mahaffey
V. P., C. F. Buchner
Sec.-Treas., E. R. Christman
Gen. Supt., Dee Miller
Ch. Egr., R. E. Hilpert
Supts., J. B. Cristman, Tulsa, Okla.; E. O. Bishop, Avant, Okla.
Plant in Oklahoma
Capacity, 1,200

Sinclair Prairie Oil Co., Sinclair Bldg., Tulsa, Okla.
Pres., H. L. Phillips
V. P., W. W. Baker
Sec.-Treas., A. E. Barrus
Asst. Treas., E. W. Hocker
Gen. Supt., C. L. Brown
Asst. Gen. Supt., H. M. Coulson
Sales Mgr., A. T. Scherer
Pur. Agt., H. A. Woodard
Ch. Chem., J. L. Gallagher
Ch. Egr., E. A. Wooden
Supts., Lewis Snyder, P. O. Box 68, Cleveland, Okla.; G. H. Youker, R. F.D. 1, Drumright, Okla.; W. D. Dolan, Box 578, Shamrock, Okla.; B. C. Sharrett, Box 368, Covington, Okla.; L. M. Kelsey, Box 6, Shidler, Okla.; L. N. Yates, Box E, Kenbro, Kans.; F. B. Pearce, Box 865, Seminole, Okla.; L. F. Kneeland, Box 787, Seminole, Okla.; L. C. Van Cleave, Box 4188, Oklahoma City, Okla.; K. R. Elliott, Box 80, St. Louis, Okla.; C. J. Tighe, Box 1674, Longview, Tex.; V. H. Akers, Drawer CC, Arp, Tex.; S. B. White, Drawer B, Bairoil, Wyo.
Plants in Oklahoma, Kansas, Texas and Wyoming
Capacity, 406,200

Skelly Oil Co., Skelly Bldg., Tulsa, Okla.
Pres., W. G. Skelly
V. P.s, C. C. Herndon, H. M. Stalcup, R. T. Lyons, W. T. Atkins and Emby Kaye
Sec.-Treas., F. T. Hopp
Sales Mgr., W. T. Atkins
Pur. Agt., F. W. Robertson
Supts., E. K. Anderson, Box 157, Lyman, Okla.; [illegible] Box [illegible], Seminole, Okla.; A. H. Bazell, Box 816, Burkburnett, Tex.; J. E. Carlson, Box 128, Skellytown, Tex.; M. S. Pike, Box 36, Whittenburg, Tex.; C. N. Smith, Box 37, Carter Nine, Okla.; C. A. Holmes, Box 168, Slick, Okla.; C. P. Duvall, Box 236, Cunningham, Kans.; G. E. Canady, Box 36, Route 2, Jennings, Okla.; John Rush, Box 487, Fairfax, Okla.; P. E. Stephenson, Stinnett, Tex.; A. I. Sellars, Box 1650, Tulsa, Okla.; J. A. Orton, Box 413, Wynona, Okla.
Plants in Oklahoma, Texas and Kansas
Capacity, 175,700

Sloan & Zook Co., 101 Main St., Bradford, Pa.
Pres., R. T. Zook
V. P., W. J. Sloan
Sec., C. T. Rickerson
Treas., W. J. Sloan
Gen. Supt., Paul H. Zook, Kane, Pa.
Pur. Agt., J. M. Moore
Supt., T. C. Johnson, Kane, Pa.
Plant in Pennsylvania
Capacity, 1,500

Smith Brothers Refining Co., McLean, Tex.
Pres., Vester Smith
V. P., Porter Smith
Sec.-Treas., P. J. Coffey
Plant in Texas
Capacity, 40,000

Snowden & McSweeney Co., 598 Madison Ave., New York City
Pres., H. McSweeney
V. P., J. P. Shannon
Sec., Pearl M. Snowden
Treas., Marie H. Wright
Gen. Supt., A. E. Baldwin
Supt., A. E. Baldwin, Bridgeport, Ill.
Plant in Illinois
Capacity, 1,000

Southland Gasoline Co., 417 W. Sixth St., Tulsa, Okla.
Pres., B. J. Arbon
V. P., H. M. Preston
Sec.-Treas., B. J. Arbon
Plant in Oklahoma
Capacity, 2,000

South Penn Oil Co., Chamber of Commerce Bldg., Pittsburgh, Pa.
Pres., P. H. Curry
V. P.s, F. J. Huffman, C. B. Turner
Sec., John L. Hays
Treas., T. B. Judge
Pur. Agt., W. P. Wissner
Gen. Mgr., C. F. Stevenson
Ch. Chem. and Egr., H. J. Little
Plants in West Virginia and Pennsylvania.
Capacity, 25,000

Standard Gasoline Co., 225 Bush St., San Francisco, Calif.
Pres., K. R. Kingsbury
V. P.s, W. H. Berg, R. W. Hanna, A. S. Russell
Sec., J. H. Tuttle
Treas., V. F. Palmer
Plants in California
Capacity, 682,555 (25,055 shut down)

Standard Oil Co. of Louisiana, 2134 St. Charles Ave., New Orleans, La.
Pres., J. C. Hilton
V. P.s, M. J. Rathbone, J. R. McWilliams, J. E. Skehan
V. P. and Treas., J. A. Bechtold
Gen. Mgr., W. L. Stratton
Gen. Supt., R. A. Howe, Shreveport, La.
Plants in Louisiana and Arkansas
Capacity, 17,961

Stanolind Oil & Gas Co., Philcade Bldg., Tulsa, Okla.
Chm. Bd., A. W. Peake
Pres., F. O. Prior
V. P.s, A. M. McCorkle, E. F. Bullard
Sec.-Treas., F. J. Keleher
Gen. Supt., H. W. Klein
Oper. Supt., P. G. Weidner
Asst. Oper. Supt., E. J. Goldman
Gas Egr., R. N. Hastings
Pur. Agt., W. L. James
Supts., H. U. Jarrett, Tonkawa, Okla.; A. C. Andrews, Gilliam, La.; V. N. Sibley, Midwest, Wyo.; J. D. Henry, Elk Basin, Wyo.
Plants in Oklahoma, Louisiana and Wyoming
Capacity, 148,000 (2,000 shut down)

Sterling Oil & Gas Co., 506 Thompson Bldg., Tulsa, Okla.
Pres., C. H. Petry
V. P. and Gen. Mgr., W. S. Duty
Sec.-Treas., A. E. Schmitz
Div. Supt., T. T. Curtis
Plant in Oklahoma
Capacity, 250

Stranahan & Cheuvront, 405 West Main St., Oblong, Ill.
Pres., A. B. Cheuvront
Pur. Agt., A. B. Cheuvront
Supt., J. F. Brown, 408 W. Main St., Oblong, Ill.
Plants in Illinois
Capacity, 40

Success Oil Co., 503 West Elm St., Titusville, Pa.
Pres., Geo. H. Davis
Gen. Supt., A. Porter, Jr.
Sales Mgr.-Pur. Agt., Geo. H. Davis
Plant in Pennsylvania
Capacity, 2,000

Sunray Oil Co., 740 Philcade Bldg., Tulsa, Okla.
Pres., C. H. Wright
V. P., F. L. Martin
Sec., W. D. Forster
Treas., L. W. Bennett
Gen. Supt., J. E. Thompson
Sales Mgr., F. L. Martin
Supt., R. L. Johnson, Sunray, Tex.
Ch. Chem., J. B. Fairfield
Pur. Agt., R. E. Campbell
Plant in Texas
Capacity, 18,000

Superior Oil Co., 1101 Nat'l City Bank Bldg., Los Angeles, Calif.
Pres., W. M. Keck
V. P.s, J. P. Chandler, Chas. A. Dore and W. A. Pruett
Sec. and Treas., J. P. Chandler
Asst. Treas., Howard W. Wright
Asst. Secs., F. D. Jones, Virgil L. Smith
Pur. Agt., Geo. H. Barry
Plants in California
Capacity, 113,000

Surety Oil Co., Titusville, Pa.
Plant in Pennsylvania
Capacity, 1,000

Sutton Brothers, Inc., 1370 Ridge Ave., Steubenville, Ohio
Pres., H. L. Sutton
V. P., C. E. Sutton
Sec. and Treas., N. A. Sutton
Plant in West Virginia
Capacity, 200 (shut down)

T

Tarbell & Co., Grand Valley, Pa.
Plant in Pennsylvania
Capacity, 80

Test Oil Co., Bartlesville, Okla.
Pres., M. R. Moran
Plant in Oklahoma
Capacity, 500

Texas Co., General Offices: 135 E. 42nd St., New York City
Chm. of Bd., C. B. Ames, New York City
Chm. Exec. Com., J. H. Lapham
Pres., W. S. S. Rodgers
V. P.s, T. J. Donoghue, F. T Manley, G. L. Noble, R. Ogarrio, T. Rieber and H. W. Dodge
Sec., E. M. Crone
Treas., C. E. Woodbridge
Pur. Agt., A. F. Colling
Div. Mgr., J. L. McMahon, Box 600, Wichita Falls, Tex.
Supts., M. J. Adams (North Tex. Div.) Fort Worth, Tex.; T. F. O'Brien (West Tex. and N. Mex. Div.), Cisco, Tex.; J. L. Shea (La. and Ark. Div.), Shreveport, La.; C. C. Kelly (Okla. and Kans. Div.), Tulsa, Okla.
Plants in Oklahoma, Texas, Kansas and Louisiana
Capacity, 133,800

Texas Co., California, 929 S. Broadway, Los Angeles, Calif.
Pres. and Gen. Mgr., C. E. Olmstead
V. P.s, J. A. Bermingham, H. W. Dodge, R. T. Herndon and L. R. Holmes
Gen. Coun., C. C. Stanley
Sec., E. M. Crone
Treas., C. E. Woodbridge
Sales Mgr., R. T. Herndon
Supts., H. S. Cole, Jr., Asst. Gen. Supt., 929 S. Broadway, Los Angeles, Calif.; N. H. Mull, Supt. of Gasoline Plant Operations, Los Angeles, Calif.
Plants in California
Capacity, 185,000

Texas Pacific Coal & Oil Co., 1710 Fort Worth National Bank Bldg., Fort Worth, Tex.
Pres., J. R. Penn
V. P.s, O. E. Mitchell and John Hancock
Sec. and Treas., R. Seibel
Sales Mgr., O. E. Mitchell
Pur. Agt., J. C. Davis
Supts., D. B. Hiatt, Box 2110, Fort Worth, Tex.; Jack White, Strawn, Tex.; C. S. Bronstad, Caddo, Tex.
Plants in Texas
Capacity, 25,000

Texoma Natural Gas Co., 20 North Wacker Drive, Chicago, Ill.
Pres., Judge H. O. Castor
V. P. and Gen. Mgr., Floyd C. Brown
Sec., S. E. Campbell
Asst. Treas., F. K. MacDonald
Gen. Supt., E. V. Kesinger
Pur. Agt., L. E. Biggs
Ch. Chem., E. G. Hammerschmidt
Ch. Egr., G. M. Davidson
Supt., R. T. Powers, P. O. Box 36, Fritch, Tex.
Plant in Texas
Capacity, 60,000

Thomas, R. L., 290 Main St., Tidioute, Pa.
Owner, R. L. Thomas
Plant in Pennsylvania
Capacity, 250

Tompsett Brothers, Tidioute, Pa.
Pres., W. C. Tompsett
Plant in Pennsylvania
Capacity, 500

Triangle Co., Box 100, McKees Rocks, Pa.
Pres., J. B. Montgomery
Sec., Bert Noble
Treas., S. H. Morgan
Sales Mgr., Bert Noble
Pur. Agt., Bert Noble
Ch. Egr., A. A. Bock
Plant in Pennsylvania
Capacity, 450

Triumph Petroleum Co., Route 3, Tidioute, Pa.
Co-partnership
E. R. Johnson, one of partners
Plant in Pennsylvania
Capacity, 175

Tucker Oil Co., 1210 City National Bank Bldg., Wichita Falls, Tex.
Pres., J. J. Perkins
V. P., Chas. J. Tucker
Sec.-Treas., Harold Murph
Gen. Supt., Chas. J. Tucker
Supt., L. B. Horr, Box 641, Burkburnett, Tex.
Plant in Texas
Capacity, 5,000

Tyler Oil Co., Sistersville, W. Va.
Pres., H. J. Crawford
V. P., J. P. Flynn
Sec., Nell B. McCoy
Gen. Supt., J. P. Flynn
Plants in West Virginia and Ohio
Capacity, 149

U

Union Gas System, Inc., Nat'l Bank Bldg., Independence, Kans.
Pres., Paul R. Johnson
V. P., D. W. Stewart
Sec., D. W. Stewart
Treas., H. F. Mitchell
Gen. Supt., L. J. Love
Ch. Egr., F. L. Rupp
Pur. Agt., W. L. Orr
Plant in Kansas
Capacity, 2,000 (shut down)

Union Gasoline & Oil Corp., Kanawha Valley Bldg., Charleston, W. Va.
Pres., Chas. A. Munroe
V. P.s, J. L. Harrop, C. F. Huff and R. N. Parks
Sec., L. V. Watkins
Treas., N. E. Shupe
Sales Mgr., R. N. Parks
Ch. Chem., J. E. Pew
Supts., W. H. Dardinger, Moundsville, W. Va., and Chas. Stackpole, Porter Falls, W. Va.
Plants in Pennsylvania and West Virginia.
Capacity, 16,800

Union Gas Products, Inc., 710 Ouachita Bank Bldg., Monroe, La.
Pres., D. S. Lansden
V. P., C. M. Rose
Sec., Henry Bernstein
Treas., D. S. Lansden
Gen. Supt., H. C. Walton
Pur. Agt., H. C. Walton
Plant in Louisiana
Capacity, 6,000

Union Oil Co. of California, 617 West Seventh St., Los Angeles, Calif.
Pres., L. P. St. Clair
V. P.s, R. D. Mathews, W. W. Orcutt, W. L. Stewart, Jr., and P. M. Gregg
Sec., W. R. Edwards
Treas., J. M. Rust
Dir. of Mfg., R. E. Haylett
Gas Mgr., R. D. Gibbs
Director of Sales, V. H. Kelly
Mgr. of Research, D. R. Merrill
Mgr. of Purch., H. C. Farquhar
Div. Egr., Earle W. Gard
Supts., Lafe Todd (Northern Div.), San Luis Obispo, Calif.; J. C. Rector (Southern Div.), Santa Fe Springs, Calif.
Plants in California
Capacity, 194,750

United Carbon Co., Union Bldg., Charleston, W. Va.
Pres., Oscar Nelson
V. P.s, G. A. Williams, H. C. Pearson, T. F. Koblegard and T. S. Reed
Sec., C. H. McHenry
Treas., T. A. Whalen
Pur. Agt., C. A. Urban
Ch. Chem., G. L. Roberts
Ch. Egr., H. E. Norrick
Supts., A. J. MacKinnon, Box 1783, Monroe, La.; E. L. Barron, Box 1783, Monroe, La.
Plants in Louisiana
Capacity, 16,000

United Gas Public Service Co., Rusk Bldg., Houston, Tex.
Pres., N. C. McGowen, Shreveport, La.
V. P.s, R. H. Hargrove and J. V. Strange
Comptroller, S. L. Davis
Treas., L. V. Tracht
Gen. Supt., W. F. Fulton
Pur. Agt., R. A. Reeder
Ch. Egr., A. D. Greene
Supts., H. S. Ridings, Cotton Valley, La.; L. O. Lawless (Latex), Bethany, La.; A. Meeks (Sugar Creek), Athens, La.; F. C. Dugan, Refugio, Tex.; O. M. Campbell, Archibald, La.; J. L. Gilbert, Myrtis, La.
Plants in Louisiana and Texas
Capacity, 206,800 (3,800 shut down)

Universal Consolidated Oil Co., 417 S. Hill St., Los Angeles, Calif.
Pres., E. G. Starr
V. P., R. E. Stearns
Sec., R. D. Miller
Treas., C. A. Zanzot
Gen. Supt., Geo. A. Coffey
Pur. Agt., P. J. Hayes
Pet. Eng., G. S. Follansbee, Jr.
Supts., F. V. Falenzer, Box B, Oilfields, Calif.; L. F. Barrows, Lost Hills, Calif.
Plants in California
Capacity, 10,000

Utilities Production Corp., 700 Oklahoma Bldg., Tulsa, Okla. (See Central States Production Corp.)
Plant in Oklahoma
Capacity, 600 (shut down)

V

Victor Gasoline Co., 624 So. Cheyenne Ave., Tulsa, Okla.
Pres., M. F. Powers
V. P., C. P. Quinlan
Sec., J. L. Goddard
Treas., Felix Quinlan, Jr.
Gen. Supt., M. F. Powers
Sales Mgr., E. C. Sager
Pur. Agt. and Ch. Egr., F. George Heinze
Supts., L. J. Rush, Bristow, Okla.; D. B. Gilmore, Stroud, Okla.; J. J. Powers, Box 156, Seminole, Okla.
Plants in Oklahoma
Capacity, 7,500

Viking Distributing Co. (Same Offices as Virginian Gasoline & Oil Co.)
Plants in West Virginia
Capacity, 1,000

Vincennes Oil & Gas Co., Oliphant Bldg., Vincennes, Ind.

Pres., E. M. Kerlin
V. P., C. E. Kerlin
Sec.-Treas., R. D. Green
Gen. Supt., R. C. Kerlin
Supt., Homer Means, Route 4, Lawrenceville, Ill.
Plant in Illinois
Capacity, 2,000

Virginian Gasoline & Oil Co., Kanawha Valley Bldg., Charleston, W. Va.

Pres., Chas. A. Munroe
V. P.s, James L. Harrop, Chas. F. Huff, Ralph N. Parks
Sec., Leith V. Watkins
Treas., N. E. Shupe
Sales Mgr., R. N. Parks
Ch. Chem., J. E. Pew
Supts., W. L. Haynes, Clendenin, W. Va.; W. H. Evilsizer, Villa Route, Box 8, Charleston, W. Va.; C. R. Smith, R.F.D. No. 2, Box 240, St. Albans, W. Va.; Geo. Kiser, Hubball, W. Va.; C. H. Copenhaver, Stoffel, W. Va.; Owen Wheeler, R.F.D. No. 1, Catlettsburg, Ky.; Geo. S. Robinson, Box 162, Mammoth, W. Va.; R. A. Cyrus, Ona, W. Va.; H. W. Critchfield, Sandyville, W. Va.; Ray Grabeel, Box 292, Louisa, Ky.; W. F. Burdette, Three Mile, W. Va.; Silas Clark, Pad, W. Va.; S. M. Pittman, R.F.D. No. 1, Box 127, Charleston, W. Va.; Harry F. Haught, Box 388, Spencer, W. Va.; M. H. Griffith, Kermit, W. Va.
Plants in West Virginia and Kentucky
Capacity, 188,300

W

Waggoner Gasoline Co., Electra, Tex.

Pres., W. T. Waggoner, Sr.
V. P., G. L. Waggoner
Sec.-Treas., E. P. Waggoner
Gen. Supt., A. E. Stuard
Sales Mgr., H. D. Jenkins
Pur. Agt., J. T. McNamara
Plant in Texas
Capacity, 20,000

Wahl, A. R., 249 Main St., Evans City, Pa.

Owner, A. R. Wahl
Gen. Supt. and Pur. Agt., Chester Wahl
Plant in Pennsylvania
Capacity, 150

Warner-Caldwell Oil Co., Second National Bank Bldg., Titusville, Pa.

Pres., Alex N. Warner
V. P., J. H. Caldwell, Jr.
Sec.-Treas., Floyd B. August
Gen. Supt., Alex N. Warner
Supt., John T. Dalton, R.F.D. 2, Titusville, Pa.
Plant in Pennsylvania
Capacity, 1,000

Warren Petroleum Co., National Bank of Tulsa Bldg., Tulsa, Okla.

Pres., W. K. Warren
V. P., J. A. La Fortune
Sec., H. E. Felt
Treas., A. J. Murphy
Gen. Supt., M. E. Mockley
Sales Mgr., J. A. La Fortune
Ch. Chem., S. S. Allender
Pur. Agt., A. J. Murphy
Ch. Egr., H. W. Harts
Supts., C. E. Cullum, Holdenville, Okla.; D. B. Young, Ada, Okla.
Plants in Oklahoma
Capacity, 65,000

Wentz, L. H. (Oil Division) Ponca City, Okla.

Gen. Supt., O. H. Schoenwald
Pur. Agt., S. C. Harkness
Supts., E. Whitehead, Jr., Tonkawa, Okla.; M. F. Johnson, R.F.D. 3, Newkirk, Okla.
Plants in Oklahoma
Capacity, 8,000

West Coast Refining Co., 1003 Richfield Bldg., Los Angeles, Calif.

Pres., A. H. Bradford
V. P., M. D. Schatzman
Sec.-Treas., W. B. Ogden
Gen. Supt., W. M. Bradford
Supt., B. M. Hennessey, Placentia, Calif.
Plant in California
Capacity, 50,000

Western Oil Corp. of Texas, Phileade Bldg., Tulsa, Okla.

Pres., J. F. Darby
V. P., Carl Pursel
Sec.-Treas., C. F. Lynde
Supt., J. R. Gilbert, Electra, Tex.
Plant in Texas
Capacity, 2,000

Western States Gasoline Corp., 609 So. Grande Ave., Los Angeles, Calif.

Pres. and Treas., C. R. Gallagher
V. P., E. McGowan
Sec., G. C. O'Connell
Gen. Supt., W. N. Roper, Box 7, Avenal, Calif.
Pur. Agt., C. E. Spangler
Plant in California
Capacity, 160,000

Westoak Gasoline Co., Box 507, Sayre, Okla.

Pres., T. J. Butler
V. P., W. F. Seeger
Sec.-Treas., Ewell Nalle
Gen. Supt., Herman Cornett
Pur. Agt., W. F. Seeger
Ch. Egr., E. Adams
Plant in Oklahoma
Capacity, 7,000

West Texas Gas Co., Lubbock, Tex.

Pres., A. R. Jones, Kansas City, Mo.
V. P.s, R. F. Hinchey, H. A. Meyer, Tulsa, Okla.; M. O. Snyder, Amarillo, Tex.
Sec.-Treas., George Baird
Gen. Supt., E. C. Wagner, Amarillo, Tex.
Pur. Agt., E. D. Parker
Supt., John LeGate, Lubbock, Tex.
Plant in Texas
Capacity, 10,000

Wheeler, D. H., Box 86, Petrolia, Pa.

Plant in Pennsylvania
Capacity, 200

Wilcox (H. F.), Oil & Gas Co., 310 W. Sixth St., Tulsa, Okla.

Pres., Homer F. Wilcox
V. P. and Gen. Supt., F. H. Dunn
V. P. and Treas., M. P. Appleby
Sales Mgr., L. G. Murrell
Pur. Agt., F. H. Dunn
Ch. Chem., W. M. Fraser
Ch. Egr., W. R. Bingham
Supt., J. A. Berry, Box 398, Pampa, Tex.
Plants in Oklahoma and Texas
Capacity, 10,500 (2,500 shut down)

Wilshire Oil Co., Inc., 2455 E. Twenty-seventh St., Los Angeles, Calif.

Pres., Alfred P. Machris
Gen. Supt., W. D. Smith
Sales Mgr., M. M. Fletcher
Pur. Agt., A. Pateracki
Ch. Chem., T. B. Gates
Supts., T. B. Gates, 2455 E. Twenty-seventh St., Los Angeles, Calif.; Mr. Seppi, 2455 E. Twenty-seventh St., Los Angeles, Calif.; W. D. Smith, 2455 E. Twenty-seventh St., Los Angeles, Calif.
Plant in California
Capacity, 110,000

Wirt Gasoline Co., 91 Main St., Bradford, Pa.

Pres., Nathan Nichols
Sec., Charles Nichols
Treas., Nathan Nichols
Gen. Supt., Charles Nichols
Ch. Egr., L. L. Hardman
Supt., John Gould, Bolivar, N. Y.
Plant in New York
Capacity, 500 (shut down)

Wolverine Petroleum Corp., Shell Bldg., St. Louis, Mo.

Pres., Alexander Fraser
V. P.s, J. W. Watson and H. H. Anderson
Sec.-Treas., P. R. Chenoweth
Pur. Agt., C. B. Singleton
Supts., S. U. Young, Dillard, Okla.; R. R. Dollins, Avant, Okla.; R. R. Dollins, Wilson, Okla.
Plants in Oklahoma
Capacity, 18,500

Wright (J. H.), Estates, Sapulpa, Okla.

Executrix, Rosa B. Wright
Gen. Supt., A. B. Nigh
Sales Mgr., M. L. Murphy
Ch. Chem., A. B. Nigh
Ch. Egr., A. B. Nigh
Plant in Oklahoma
Capacity, 5,000

1936 Survey of Natural Gasoline Plants in U. S.

ARKANSAS

Company and plant address—	Field location—	Type of plant	Daily cap'y (gals.)
Arkansas Louisiana Gas Co., Shreveport, La.	Sec. 21-17s-15w	C-A	5,000
Gulf Refining Co. of Louisiana, El Dorado	El Dorado south field	Absp.	4,000
Henderson Co., Amarillo, Tex.	1½ mi. S of El Dorado	Comp.	4,000
Henderson Co., Amarillo, Tex.	9 mi. NE El Dorado	Comp.	8,000
Imperial Oil & Gas Products Co., Smackover	Smackover	Comp.	500
Louisiana Iron & Supply Co., Shreveport, La.	Louann	Absp.	5,000
Magnolia Petroleum Co., Louann	Sec. 8-15-16, Union County	Absp.	5,000
Rainbow Gasoline Co., Tulsa	Sec. 10-17-14	C-A	20,000
Standard Oil Co. of Louisiana	El Dorado, 3 mi.	C-A	9,720
Standard Oil Co. of Louisiana	Smackover, 3 mi.	C-A	1,045

CALIFORNIA

Company and plant address—	Field location—	Type of plant	Daily cap'y (gals.)
Bankline Oil Co., Willow St., Signal Hill	Farm Lot 64, Signal Hill	Absp.	12,500
Barnsdall Oil Co., Los Angeles	Sec. 14-14n-29w	Absp.	60,000
Belridge Oil Co., Taft	Elk Hills, sec. 24-30-24	Absp.	7,000
Belridge Oil Co., McKittrick	Belridge, sec. 26-27-20	Absp.	50,000
Belridge Oil Co., McKittrick	South Belridge, sec. 32-28-27	Absp.	*5,000
Belridge Oil Co., McKittrick	Belridge, sec. 35-27-20	Absp.	5,000
Bres Canyon Oil Co.	Coyote Hills	C-A	14,000
Calumet Oil Co., Fillmore	Sec. 3-3-19, Ventura County	Comp.	900
Coline Gasoline Corp., Torrance	Lot 2, Rancho San Pedro	Absp.	10,000
Coline Gasoline Corp., Rincon	Sec. 17-2-24	Absp.	6,000
Cowan Oil & Refining Co., 6th and Spring St., Los Angeles	Belridge	Absp.	25,000
Del Rey Oil & Gas Co., Venice	500 ft. E and 30 ft. S from NE cor., Lot 14, Blk. 13, Del Rey Beach	Absp.	75,000
Edington Gasoline & Refining Co., Inglewood	Aerick & Eastwood Sts., Inglewood	Absp.	6,000
Field, O. C., Gasoline Corp., 111 W. 7th St., Los Angeles	Huntington Beach	Absp.	30,000
Field, O. C., Gasoline Corp., 111 W. 7th St., Los Angeles	Huntington Beach	Comp.	12,000
Field, O. C., Gasoline Corp., 111 W. 7th St., Los Angeles	Huntington Beach	Absp.	35,000
Fullerton Oil Co., R.F.D. 3, Box 72, Fullerton	Sec. 2-3-10w, Orange County	Absp.	6,000
General Petroleum Corp. of California, Higgins Bldg., Los Angeles	Santa Fe Springs	Absp.	175,000
General Petroleum Corp. of California, Higgins Bldg., Los Angeles	Ventura	Absp.	40,000
General Petroleum Corp. of California, Higgins Bldg., Los Angeles	Athens	C-A	40,000
General Petroleum Corp. of California, Higgins Bldg., Los Angeles	Brea-Olinda	Absp.	20,000
Gilmore-Dabney, Inc., 2423 E. 28th St., Los Angeles	No. 1—2140 Walnut Ave., Long Beach	Absp.	30,000
Gilmore-Dabney, Inc., 2423 E. 28th St., Los Angeles	No. 2—Columbia & Linden,, Long Beach	Absp.	*30,000
Gilmore-Dabney, Inc., 2423 E. 28th St., Los Angeles	No. 3—32nd & Elm Ave., Long Beach	Absp.	30,000
Gilmore-Dabney, Inc., 2423 E. 28th St., Los Angeles	No. 4—21st & Temple, Long Beach	Absp.	*30,000
Honolulu Oil Corp., Ltd., P.O. Box H, Taft	Sec. 8-32-24	C-A	60,000
Honolulu Oil Corp., Ltd., P.O. Box H, Taft	Sec. 8-32-24	Absp.	20,000
Hokom Oil & Gasoline Co. (J), Lawndale	Lawndale	Absp.	5,000
Italo Petroleum Corp., Coalinga	Coalinga, sec. 6-21s-15e	Absp.	300
Lomita Gasoline Co., Box 851, Long Beach	Signal Hill	Absp.	40,000
Lomita Gasoline Co., Box 851, Long Beach	Bakersfield	Absp.	20,000
Los Nietos Producing & Refining Co., Ltd.	Sec. 2-22s-17e	Absp.	100,000
Mohawk Petroleum Co., Bakersfield	Mountain View	Absp.	10,000
Norwalk Co., The, Santa Fe Springs	SE SW, sec. 6, T. 3s, R. 11f, S.B.B.&M.	Absp.	50,000
Norwalk Co., The, Bin WW, Taft	Sec. 30, T. 31s, R. 24e, M.D.B.&M.	Absp.	10,000
Norwalk Co., The, Bin WW, Maricopa	SE, sec. 36, T.12n, R. 24e, S.B.B.&M.	Absp.	10,000
Ohio Oil Co., Los Angeles	Los Angeles County	Absp.	20,000
Pacific Western Oil Co., Los Angeles	Sec. 16-4n-29w	Absp.	15,000
Pacific Western Oil Co., Los Angeles	Sec. 28-3n-23w	Absp.	15,000
Reservoir Hill Gasoline Co., 855 Subway Terminal Bldg., Los Angeles	Lot 24, Alamitos, Long Beach	Absp.	30,000
Rice Ranch Oil Co., 262 S. Los Angeles St., Los Angeles	Santa Maria field	Absp.	6,000
Rio Grande Oil Co., 855 Subway Terminal Bldg., Los Angeles	Santa Fe Springs	Absp.	*30,000
St. Helens Petroleum Co., Ltd., Box 348, Montebello	Sec. 2-2-12, Los Angeles	Absp.	*750
St. Helens Petroleum Co., Ltd., Box D, Taft	Sec. 16-32-24, Kern County	Absp.	*2,500
Shell Oil Co. of California, 200 Bush St., San Francisco	Graside lease, Coyote Hills	Absp.	40,000
Shell Oil Co. of California	Sec. 27, Coalinga Hills	Absp.	*4,000
Shell Oil Co. of California	Reyes, Dominguez field	Absp.	32,000
Shell Oil Co. of California	Rindge, Inglewood field	Absp.	10,000
Shell Oil Co. of California	Coseboom, Long Beach	Absp.	220,000
Shell Oil Co. of California	Careaga, Santa Maria field	Absp.	4,000

Company and plant address—	Field location—	Type of plant	Daily cap'y (gals.)
Shell Oil Co. of California	Gosnell, Ventura field	Absp.	130,000
Signal Oil Co., 811 W. 7th St., Los Angeles	Elwood field	Absp.	10,000
Signal Oil Co., 811 W. 7th St., Los Angeles	Signal Hill	Absp.	30,000
Signal Oil Co., 811 W. 7th St., Los Angeles	Signal Hill	Absp.	20,000
Signal Oil Co., 811 W. 7th St., Los Angeles	Signal Hill	Absp.	10,000
Signal Oil Co., 811 W. 7th St., Los Angeles	Signal Hill	Absp.	*15,000
Signal Oil Co., 811 W. 7th St., Los Angeles	Signal Hill	Absp.	10,000
Signal Hill Gasoline Co., Long Beach	Long Beach field	Absp.	*35,000
Signal Hill Gasoline Co., Long Beach	Long Beach field	Absp.	*10,000
Signal Hill Gasoline Co., Elk Hills	Elk Hills field	Absp.	5,000
Signal Hill Gasoline Co., Seacliff	Seacliff field	Absp.	15,000
Signal Hill Gasoline Co., Huntington Beach	Huntington Beach field	Absp.	15,000
Signal Hill Gasoline Co.	Sunset-Midway field	Absp.	2,000
Standard Gasoline Co., San Francisco	Santa Fe Springs	Absp.	35,000
Standard Gasoline Co., San Francisco	Montebello	Booster	*2,300
Standard Gasoline Co., San Francisco	Murphy Coyote	Absp.	25,000
Standard Gasoline Co., San Francisco	Brea	Absp.	10,000
Standard Gasoline Co., San Francisco	Huntington Beach	Absp.	23,000
Standard Gasoline Co., San Francisco	Huntington Beach	Absp.	15,000
Standard Gasoline Co., San Francisco	Huntington Beach	Absp.	12,000
Standard Gasoline Co., San Francisco	Mountain View	Absp.	10,000
Standard Gasoline Co., San Francisco	Mountain View	Absp.	8,000
Standard Gasoline Co., San Francisco	Seal Beach	Absp.	20,000
Standard Gasoline Co., San Francisco	Long Beach	Absp.	25,000
Standard Gasoline Co., San Francisco	Dominguez	Absp.	*6,755
Standard Gasoline Co., San Francisco	Lost Hills	Absp.	4,000
Standard Gasoline Co., San Francisco	Inglewood	Absp.	14,000
Standard Gasoline Co., San Francisco	Torrance	Absp.	4,000
Standard Gasoline Co., San Francisco	Ventura	Absp.	25,000
Standard Gasoline Co., San Francisco	Ventura	Absp.	25,000
Standard Gasoline Co., San Francisco	Taft	Absp.	16,000
Standard Gasoline Co., San Francisco	Taft	Absp.	16,000
Standard Gasoline Co., San Francisco	Taft	Absp.	*6,000
Standard Gasoline Co., San Francisco	Taft	Absp.	8,000
Standard Gasoline Co., San Francisco	Taft	Absp.	*10,000
Standard Gasoline Co., San Francisco	Taft	Absp.	7,500
Standard Gasoline Co., San Francisco	Taft	Absp.	10,000
Standard Gasoline Co., San Francisco	Kettleman Hills	Absp.	35,000
Standard Gasoline Co., San Francisco	Kettleman Hills	Absp.	135,000
Standard Gasoline Co., San Francisco	Kettleman Hills	Absp.	80,000
Standard Gasoline Co., San Francisco	Kettleman Hills	Absp.	85,000
State Gasoline Corp., 900 Spring Arcade Bldg., Los Angeles	Long Beach	Absp.	15,000
State Gasoline Corp.	Long Beach	Absp.	22,500
Superior Oil Co., 1100 Natl. City Bank Bldg., Los Angeles	Jeughin lease, Torrance field	Absp.	2,300
Superior Oil Co.	Kettleman Hills field	Absp.	110,000
Texas Company, The (California)	Signal Hill	Absp.	75,000
Texas Company, The (California)	Santa Fe Springs	Absp.	75,000
Texas Company, The (California)	Huntington Beach	Absp.	20,000
Texas Company, The (California)	Montebello	Absp.	2,500
Texas Company, The (California)	Sec. 2-22-17e	Comp.	10,500
Texas Company, The (California)	Fillmore-Shield	Absp.	2,500
Union Oil Co. of California, Placentia	Morse lease, Richfield field	Absp.	10,000
Union Oil Co. of California, Brea	Stearns lease, Brea field	Absp.	22,500
Union Oil Co. of California, Santa Fe Springs	Bell lease, Santa Fe Springs	Absp.	70,000
Union Oil Co. of California, Compton	Hellman lease, Dominguez field	Absp.	55,000
Union Oil Co. of California, Athens	Rosecrans lease, Rosecrans field	Absp.	27,000
Union Oil Co. of California, Santa Paula	Santa Paula refinery, Santa Paulo field	Absp.	250
Union Oil Co. of California, Orcutt	Newlove lease, Santa Maria field	Absp.	10,000
Universal Consolidated Oil Co., 950 Subway Terminal Bldg., Los Angeles	Lost Hills field	Absp.	*2,000
Universal Consolidated Oil Co., 950 Subway Terminal Bldg., Los Angeles	Montebello	Absp.	8,000
West Coast Refining Co., 1320 Pacific Finance Bldg., Los Angeles	Richfield	Absp.	50,000
Western States Gasoline Corp., 609 S. Grand, Los Angeles	Sec. 2-22-17	Absp.	16,000
Western States Gasoline Corp., 609 S. Grand, Los Angeles	San Miguelito	Absp.	4,000
Wilshire Oil Co., Inc., 2455 E. 27th St. Vernon	Santa Fe Springs	Absp.	110,000

COLORADO

Continental Oil Co., Denver, Colo	Sec. 6-9-68w	Absp.	6,000
Mountain States Oil Corp.	Barela, S. W.	Absp.	6,000

ILLINOIS

American Oil Development Co., 1601 Oliver Bldg., Pittsburgh, Pa.	Crawford County	Comp.	100
American Oil Development Co., 1601 Oliver Bldg., Pittsburgh, Pa.	Crawford County	Comp.	100
Arkansas Fuel Oil Co., Robinson	Sec. 3, Prairie Twp., Crawford	Comp.	2,000
Tide Water Oil Co., 17 Battery Place, New York, N. Y.	Crawford County	Comp.	1,300
Bell Bros., Robinson	Casey	Comp.	150
Bell Bros., Robinson	Robinson	Comp.	130
Big Four Oil & Gas Co., Pittsburgh, Pa.	Bridgeport	Comp.	300
Brenneman & MacDonell, Oblong	Sec. 6-6-13, Crawford County	Comp.	1,000
Brenneman & MacDonell, Oblong	Sec. 7-7-13, Crawford County	Comp.	200
International Oil & Gas Co., Washington, Pa.	Crawford County	Comp.	2,000
Kenawee Oil & Gas Co., Robinson	Crawford County	Comp.	350
Kenawee Oil & Gas Co., Robinson	Lawrence County	Comp.	125
Mahutska Oil Co., Robinson	Sec. 17-7-13	Comp.	250
Mahutska Oil Co., Robinson	Sec. 28-6-13	Comp.	250
Mahutska Oil Co., Robinson	Sec. 10-6-13	Comp.	1,000
Mahutska Oil Co., Robinson	Sec. 30-7-13	Comp.	500
Mallory & Crawford, Bradford, Pa.	Oblong, ¼ mi. E	Comp.	110
Nolan & Lamberton, Box 1338, Tulsa, Okla.	Sec. 12-7-14, Crawford County	Comp.	100
Ohio Oil Co., Casey	Clark County	Comp.	*124
Ohio Oil Co., Casey	Clark County	Comp.	*241
Ohio Oil Co., Casey	Cumberland County	Comp.	1,150
Ohio Oil Co., Oblong	Crawford County	Comp.	405
Ohio Oil Co., Oblong	Crawford County	Comp.	242
Ohio Oil Co., Oblong	Crawford County	Comp.	310
Ohio Oil Co., Robinson	Crawford County	Comp.	243
Ohio Oil Co., Hardinville	Crawford County	Comp.	756
Ohio Oil Co., Hardinville	Crawford County	Comp.	100
Ohio Oil Co., Oblong	Crawford County	Comp.	342
Ohio Oil Co., Stoy	Crawford County	Comp.	310
Ohio Oil Co., Stoy	Crawford County	Comp.	833
Ohio Oil Co., Oblong	Crawford County	Comp.	200
Ohio Oil Co., Oblong	Crawford County	Comp.	1,130
Ohio Oil Co., Bridgeport	Lawrence County	Comp.	570
Ohio Oil Co., Bridgeport	Lawrence County	Comp.	*570
Ohio Oil Co., Bridgeport	Lawrence County	Comp.	1,300
Ohio Oil Co., Bridgeport	Lawrence County	Comp.	*1,190
Ohio Oil Co., Bridgeport	Lawrence County	Comp.	990
Ohio Oil Co., Bridgeport	Lawrence County	Comp.	*1,000
Ohio Oil Co., Lawrence	Lawrence County	Comp.	*500
Ohio Oil Co., Bridgeport	Lawrence County	Comp.	1,050
Ohio Oil Co., Bridgeport	Lawrence County	Comp.	1,050

Company and plant address—	Field location—	Type of plant	Daily cap'y (gals.)
Ohio Oil Co., Bridgeport	Lawrence County	Comp.	*250
Ohio Oil Co., Bridgeport	Lawrence County	Comp.	*200
Ohio Oil Co., Bridgeport	Lawrence County	Comp.	*1,400
Ohio Oil Co., Bridgeport	Lawrence County	Comp.	1,500
Ohio Oil Co., Bridgeport	Lawrence County	Comp.	1,500
Ohio Oil Co., Bridgeport	Lawrence County	Comp.	*200
Ohio Oil Co., Bridgeport	Lawrence County	Comp.	*1,200
Ohio Oil Co., Bridgeport	Lawrence County	Comp.	*375
Ohio Oil Co., Bridgeport	Lawrence County	Comp.	1,140
Ohio Oil Co., Bridgeport	Lawrence County	Comp.	*770
Ohio Oil Co., Bridgeport	Lawrence County	Comp.	*450
Snowden & McSweeney Co., Bridgeport	E half SE, sec. 17-3-12w	Topping	1,000
Splane, W. W., Oil City, Pa.	Robinson	Comp.	300
Stranahan & Cheuvront, 405 W. Main St., Oblong	Sec. 11-7-13	Comp.	30
Stranahan & Cheuvront, 405 W. Main St., Oblong	Sec. 22-6-13	Comp.	30
Vacuum Gasoline Co., Lawrenceville	Lawrence County	Comp.	5,000
Vincennes Oil & Gas Co., Vincennes, Ind.	Lawrence County	Comp.	2,000

KANSAS

Altitude Petroleum Co., Kennedy Bldg., Tulsa, Okla.	Chanute	Comp.	2,000
Barnsdall Oil Co., Route 2, Box 173, Oxford†	NW, sec. 20-33-3	Absp.	20,000
Consolidated Gas Utilities Corp., Wellington	Sec. 24-32s-1w	Absp.	*12,000
Empire Oil & Refining Co., Caney	SW, sec. 13-35-13	Absp.	*10,000
Empire Oil & Refining Co., Arkansas City	SE, sec. 13-34-3	Absp.	*15,000
Empire Oil & Refining Co., Tetorville	SW, sec. 16-23-9	Absp.	12,000
Empire Oil & Refining Co., Madison	NW, sec. 8-23-11	Absp.	9,000
Empire Oil & Refining Co., Burrton	Sec. 25-23-4w	Absp.	30,000
Empire Oil & Refining Co., Wellington	SW, sec. 17-32-1	Absp.	*12,000
Empire Oil & Refining Co., Madison	NE, sec. 14-22-11	Comp.	4,000
Empire Oil & Refining Co., Wichita	NW, sec. 17-28-1	Absp.	40,000
Kansas Power & Light Co., Box 900, Salina	SW, sec. 29-18-2w	Absp.	15,000
Kansas Power & Light Co., Box 900, Salina	NE, sec. 13-32-12w	Absp.	5,000
Kansas Gasoline Co., Box 1978, Tulsa, Okla.	Sec. 24-32s-4e, Cowley County	Absp.	5,000
McPherson Oil & Gas Development Co., United Life Bldg., Salina	SW, sec. 29-18-2w	Absp.	10,000
Pep Gasoline Co.	Sedan, 2 mi. E	Comp.	1,500
Shell Petroleum Corp., Oxford	SE, sec. 25-31s-2e	Comp.	271
Sinclair Prairie Oil Co., Box E, Kenbro	SW, sec. 20-22-10e	Comp.	7,000
Skelly Oil Co., Box 236, Cunningham	Sec. 30-27s-10w, Kingman County	Absp.	5,000
Union Gas System, Inc., Independence	S of Caney	Absp.	*2,000
Texas Co., The (Delaware), O'Brien Switch	Sec. 31-30n-6e	Absp.	12,000
Texas Co., The (Delaware), Gordon	Sec. 28-26n-5e	Absp.	6,000
Union Gasoline Co., Caney	Sec. 29-29-13, Washington County	Absp.	5,000

†Owned jointly with Continental Oil Co.
*Shut down part of each year.

KENTUCKY

Coast Oil Co., Monticello	Monticello	Comp.	*500
Heck, W. B., & Co., Box 164, Owensboro, Ky.	Monticello	Comp.	*300
Kentucky Pipe Line Co., 311 W. Chestnut St., Louisville	Clark County	Char.	2,600
Louisville Gas & Electric Co.	Winchester	Char.	2,500
Virginian Gasoline & Oil Co., Kermit, W. Va.	Martin County	Absp.	10,000
Virginian Gasoline & Oil Co., Catlettsburg	Boyd County	Absp.	24,000

LOUISIANA

Arkansas Fuel Oil Co., Shreveport	Sec. 24-21n-8w, Claiborne	Comp.	5,000
Arkansas-Louisiana Gas Co., Shreveport	Sec. 26-23n-16w	Absp.	40,000
Century Carbon Co., Monroe	Ouachita Parish	Absp.	2,000
Century Carbon Co., Monroe	Richland Parish	Absp.	2,200
Columbian Gasoline Corp., R.F.D., Rayville	Sec. 10-16n-6e, Richland	Absp.	6,000
Columbian Gasoline Corp., Swartz	Sec. 5-18n-5e, Ouachita	Absp.	2,000
Columbian Gasoline Corp., Fairbanks	Sec. 2-19n-1e, Ouachita	Absp.	2,000
Columbian Gasoline Corp., R.F.D. 2, Bastrop	Sec. 19-23n-5e, Morehouse	Absp.	1,000
DeSota Gasoline Co.	Mansfield	Comp.	900
Gulf Refining Co. of Louisiana, Mooringsport	Caddo	Comp.	3,000
Gulf Refining Co. of Louisiana, Mooringsport	Homer	Absp.	10,000
Herkness, J. Smylie, R.F.D. 3, Bastrop	Morehouse Parish	Absp.	*1,000
Huber, J. M., Corp., Swartz	Sec. 5-18n-5e	Absp.	2,000
Louisiana Gas & Fuel Co.	Alto	Absp.	36,000
Louisiana Gas & Fuel Co.	Uscarco	Absp.	4,000
Magnolia Petroleum Co., Louann, Ark.	Sec. 12-12-11, Red River	Comp.	1,300
Monroe-Louisiana Carbon Co., Swartz	Secs. 28 and 33-19n-5e, Ouachita Parish	Comp.	*2,000
Ohio Oil Co., Haynesville	Claiborne Parish (2)	Absp.	4,000
Ohio Oil Co., Treat	Webster Parish	Absp.	2,000
Pala Oil Co., Inc., Shreveport	Sec. 20-20-15	Comp.	200
Reserve Natural Gas Co. of Louisiana, Shreveport	Sec. 10-17n-14w, Caddo	Absp.	*10,000
Arkansas-Louisiana Gas Co., Shreveport	Shreveport	Absp.	*5,000
Shell Petroleum Corp., Iowa	NW, sec. 18-9s-6w	Absp.	12,000
Southwestern Gas & Electric Co., Oil City	Oil City	Comp.	450
Standard Oil Co. of Louisiana, Trees	Caddo field, near Trees	C-A	2,590
Standard Oil Co. of Louisiana, Homer	Claiborne field, near Homer	C-A	2,610
Stanolind Oil & Gas Co., Gilliam	Gilliam	Absp.	6,000
Texas Co., The (Delaware), Oil City	Sec. 3-20n-16w, Caddo	Comp.	4,000
Texas Co., The (Delaware), Oil City	Sec. 23-21n-15w, Caddo	Absp.	*18,800
Texas Co., The (Delaware), Mooringsport	Sec. 19-20n-15w, Caddo	Comp.	*800
Texas Co., The (Delaware), Naborton	Sec. 34-13n-12w, De Soto	Comp.	*4,000
Union Gas Products, Inc., 710 Ouachita Bank Bldg., Monroe	Near Swartz	C-A	6,000
United Carbon Co., Monroe	Sec. 10-16-6	Absp.	10,000
United Carbon Co., Monroe	Sec. 5-18-5	Absp.	6,000
United Gas Public Service Co., Alto	Sec. 16-16n-6e, Richland	Absp.	30,000
United Gas Public Service Co., Bastrop	Sec. 31-20n-5e, Morehouse	Absp.	*1,200
United Gas Public Service Co., Rodessa	Sec. 14-21n-15w, Caddo	Absp.	60,000
United Gas Public Service Co., Cotton Valley	Sec. 17-21n-10w, Webster	Absp.	50,000
United Gas Public Service Co., Swartz	Sec. 32-19n-5e, Ouachita	Absp.	*2,500
United Gas Public Service Co., Sugar Creek†	Sec. 6-19n-6e, Claiborne	Absp.	30,000

†Owned jointly with Sugar Creek Syndicate.

MICHIGAN

Apex Gas, Inc., Mount Pleasant	Porter Twp. on J. W. Campbell farm	Comp.	4,000
Grimes, Otha H., Box 322, Tulsa, Okla.	Mount Pleasant	C-A	6,000

MONTANA

Montana Power Gas Co., Cut Bank	Glacier County	Absp.	5,000

NEW MEXICO

Natural Gasoline Corp., Box 1589, Tulsa, Okla.	Sec. 36-19s-36e, Lea County	Absp.	56,000
Phillips Petroleum Co., Hobbs	N half NW, sec. 4-19-38	Absp.	40,000
Shell Petroleum Corp., Hobbs	SW, sec. 19-18-38e	Absp.	20,000

NEW YORK

Company and plant address—	Field location—	Type of plant	Daily cap'y (gals.)
Wirt Gasoline Co., Bradford, Pa.	Richburg	Comp.	*500
Producers Gas Co., Olean	Sanford, Allegany County	Absp.	(*)

OHIO

American Oil Development Co., Pittsburgh, Pa.	Monroe County	Comp.	500
American Oil Development Co., Pittsburgh, Pa.	Monroe County	Comp.	200
Hope Construction & Refining Co.	New Matamoras	Absp.	1,300
Jefferson Gasoline Co., Ryland	Sec. 27, Wells Twp.	Comp.	250
Ohio Producing & Refining Co. (The)	Sec. 22, Chippewa Twp., Wayne County	Char.	6,000
Pittsburgh Oil & Gas Co., Schley	Archers Fork	Comp.	200
Pittsburgh Oil & Gas Co., Southern Valley	Sycamore Valley	Comp.	200
Preston Oil Co., Homer	Burlington Twp., Licking County	Absp.	15,000
Preston Oil Co., Pavonia	Weller Twp., Richland County	Absp.	16,000
Preston Oil Co., Elk	Stock Twp., Noble County	Absp.	2,000
Preston Oil Co., Sugar Grove	Berne Twp., Fairfield County	Absp.	9,000
Preston Oil Co., Sutton	Sutton Twp., Meigs County	Absp.	*5,000
Preston Oil Co., York	York Twp., Medina County	Absp.	10,800
Reno Oil Co., Sistersville, W. Va.	Washington County	Comp.	50
River Gas Co.	New Matamoras	Absp.	125
Tyler Oil Co., Sistersville, W. Va.	Monroe County	Comp.	41

OKLAHOMA

Akin Gasoline Co., Box 1402, Tulsa	Dewey	Comp.	1,000
Akin Gasoline Co., Box 1402, Tulsa	Bixby	Comp.	1,000
Altitude Petroleum Corp., Kennedy Bldg., Tulsa	Oilton	Comp.	*5,000
American Petroleum Corp., Box 686, Healdton	SE, sec. 31-2s-2w	Absp.	12,000
Barco Gasoline Co., Wirt	Healdton field	Comp.	3,000
Barnsdall Oil Co., Box 224, Avant	SE, sec. 18-23-12	Absp.	3,000
Barnsdall Oil Co., Box 518, Earlsboro	NE, sec. 15-9-5	Absp.	25,000
Barnsdall Oil Co., Box 2039, Tulsa	SE, sec. 5-20-12	Absp.	1,500
Barnsdall Oil Co., Route 1, Barnsdall	NW, sec. 29-25-11	Absp.	3,000
Barnsdall Oil Co., Box 228, Osage	SW, sec. 20-21-9	Absp.	2,500
Barnsdall Oil Co., Box 856, Beggs	NE, sec. 6-14-12	Absp.	3,500
Bartlett Gasoline Co., Box 467, Butler	3 mi. S of Butler	Absp.	11,000
Carter Oil Co., Box 801, Tulsa	Sec. 22-4s-2w, Carter County	Absp.	6,000
Carter Oil Co., Box 801, Tulsa	Sec. 3-10n-8e, Seminole County	Absp.	16,000
Carter Oil Co., Box 801, Tulsa	Sec. 15-9n-6e, Seminole County	Absp.	50,000
Carter Oil Co., Box 801, Tulsa	Sec. 30-2n-7e, Pontotoc County	Absp.	15,000
Central States Prod. Co., Wetumka	Sec. 21-9n-10e, Hughes County	Absp.	*1,000
Coline Gasoline Corp., Oklahoma City	Sec. 24-11n-3w, Oklahoma City	Absp.	25,000
Comar Gasoline Co., Tonkawa	NE, sec. 2-24n-1w	Absp.	26,000
Comar Oil Co., Blackwell	SW, sec. 21-29n-1w	Absp.	10,000
Comar Oil Co., Blackwell	NW, sec. 5-28n-1w	Absp.	10,000
Continental Oil Co., Ponca City	Twp. 22-S13-R4w	Absp.	2,500
Coaden, J. S., Inc., Fort Worth, Tex.	Sec. 11-19n-4w	Absp.	*50,000
Coaden, J. S., Inc., Fort Worth, Tex.	Sec. 19-11n-11e	Comp.	1,000
Cromwell-Franklin Oil Co., Oklahoma City	SE SW SE, sec. 12-11n-3w	Absp.	20,000
Crosbie, Inc. (J. E.), Lovell	NW, sec. 20-19-4	Comp.	20,000
Crosbie, Inc. (J. E.), Okemah	Sec. 29-12-10	Absp.	16,000
Crosbie, Inc. (J. E.), St. Louis	S½ S½ NE, sec. 15-7-4	Absp.	20,000
Crosbie, Porter & Martin, Box 625, Okemah	SW SE, sec. 29-12-10	Absp.	16,000
Cushing Refining & Gasoline Co., Cushing	Sec. 32-18n-4e, Payne County	Absp.	7,500
Cushing Refining & Gasoline Co., Cushing	Sec. 15-27n-1w, Kay County	Absp.	7,500
Deep Rock Oil Corp., Shamrock	Sec. 4-16-7	Absp.	2,000
Deep Rock Oil Corp., Mehan	Sec. 23-13-3	Absp.	500
Deep Rock Oil Corp., Cushing	Sec. 9-18-10	Absp.	2,200
DeSoto Gasoline Co., Muskogee	Sec. 5-14-18	Comp.	366
Devonian Oil Co., Tulsa, Okla.	NE, sec. 32-7n-6w	Absp.	*16,666
Devonian Oil Co., Tulsa, Okla.	SE, Sec. 22-17n-10e	Absp.	20,000
Eagle-Picher Mining & Smelting Co., Henryetta, Okla.	Sec. 6-11n-13e	Absp.	3,000
Eason Oil Co., Enid	Enid	Absp.	10,000
Eason Oil Co., Enid	NE, 24-22-4w	Comp.	6,000
Eason Oil Co., Enid	SW, 34-17-4w	Absp.	15,000
Empire Oil & Refining Co., Tallant	SE, sec. 35-25-10	Absp.	20,000
Empire Oil & Refining Co., Seminole	SE, sec. 24-9-6	Absp.	25,000
Empire Oil & Refining Co., Seminole	SW, sec. 14-8-6	C-A	20,000
Empire Oil & Refining Co., Seminole	NE, sec. 11-8-5	Comp.	25,000
Empire Oil & Refining Co., Konawa	NW, sec. 9-6-6	Absp.	20,000
Empire Oil & Refining Co., Sasakwa	NE, sec. 7-6-8	Comp.	20,000
Empire Oil & Refining Co., Asher	NE, sec. 29-6-6	Absp.	30,000
Enfisco Oil Corp., Box 2021, Tulsa	NE, sec. 17-17-12, Bixby	Comp.	1,500
Foster & Norwood Oil Co., Bartlesville	Barnsdall	Absp.	4,000
Grimes, Otha H., and Roy O. Neal, Drumright	Sec. 17-17-7	Absp.	6,300
Grimes Gasoline Co., Tulsa	Okemah	Absp.	5,000
Grimes Gasoline Co., Tulsa	Okemah	Absp.	2,000
Grimes, C. W. and O. H., Tulsa	Weleetka	Absp.	6,000
Gulf Oil Corp. of Pa., Box 661, Tulsa	Sec. 16-17-12, Creek City	Comp.	20,000
Gulf Oil Corp. of Pa., Box 661, Tulsa	SE, sec. 1-21-7	Comp.	1,200
Gulf Oil Corp. of Pa., Box 661, Tulsa	Sec. 24-27-5, Osage City	Absp.	8,000
Gulf Oil Corp. of Pa., Box 661, Tulsa	Sec. 2-14-8, Creek City	Absp.	2,000
Gulf Oil Corp. of Pa., Box 661, Tulsa	Sec. 14-7-6, Seminole City	Absp.	11,000
Gulf Oil Corp. of Pa., Box 661, Tulsa	Sec. 7-8-6, Seminole City	Absp.	21,000
Harland Oil Co., Wolco, Okla.	SW, sec. 26-25-11	Absp.	1,500
Harland Oil Co., Wolco, Okla.	NE, sec. 25-24-11	Absp.	1,500
Indian Territory Illuminating Oil Co., Oklahoma City	SE, sec. 24-22n-3w	Absp.	25,000
Indian Territory Illuminating Oil Co., Oklahoma City	SW, sec. 19-11n-2w	Absp.	25,000
Indian Territory Illuminating Oil Co., Oklahoma City	SE, sec. 13-11n-3w	Absp.	25,000
Indian Territory Illuminating Oil Co., Oklahoma City	NW, sec. 31-11n-2w	Absp.	25,000
Indian Territory Illuminating Oil Co., Oklahoma City	SE, sec. 11-11n-2w	Absp.	25,000
Indian Territory Illuminating Oil Co., Oklahoma City	Sec. 12-11n-3w	Absp.	25,000
Magnolia Petroleum Co., Oilton	NE SW, sec. 6-19n-6e	Absp.	2,500
Magnolia Petroleum Co., Oilton	NE, sec. 7-18n-7e	Absp.	16,000
Magnolia Petroleum Co., Oilton	SW, sec. 2-16n-7e	Absp.	*8,250
Magnolia Petroleum Co., Oilton	SW, sec. 24-15n-5e	Absp.	3,600
Magnolia Petroleum Co., St. Louis	NE NW SE, sec. 16-9n-5e	Absp.	*6,000
Magnolia Petroleum Co., St. Louis	NW SW SE, sec. 15-7n-4e	Absp.	5,100
Magnolia Petroleum Co., St. Louis	W 7.85 ac., Lot 4, sec. 32-4n-8e	Absp.	3,500
Magnolia Petroleum Co., Oilton	Sec. 29-18n-5e, Payne County	Comp.	(*)
Magnolia Petroleum Co., Oilton	Sec. 17-20n-6e, Pawnee County	C-A	(*)
Magnolia Petroleum Co., Healdton	SE SE SE, sec. 22-2s-3w	Absp.	4,600
Magnolia Petroleum Co., Healdton	SW NW NE, sec. 15-4s-3w	Absp.	*2,500
Marathon Oil Co., Thompson Bldg., Tulsa	Sec. 27-16-9, Creek County	C-A	5,000
Mascogal Gasoline Co., Box 516, Tulsa	Sec. 23-21n-4e	Comp.	1,500
McBride, Inc., W. C., St. Louis, Mo.	Osage County	Comp.	1,500
Midco Oil Corp., Tulsa	Billings, 8 mi. S	Comp.	*30,000
Midco Oil Corp., Tulsa	Dewey	Comp.	*10,000
Midco Oil Corp., Tulsa	Drumright	Comp.	5,000
Midco Oil Corp., Tulsa	Oilton	Comp.	10,000
Mid-Continent Petroleum Corp., Tulsa	SE SE, sec. 22-17-7	Absp.	20,000
Mid-Continent Petroleum Corp., Tulsa	E half NW, sec. 5-16-15	Comp.	3,000
Mid-Continent Petroleum Corp., Tulsa	SW, sec. 12-13-13	Absp.	2,000
Mid-Continent Petroleum Corp., Tulsa	NE SW, sec. 15-10-8	Absp.	50,000
Mid-Continent Petroleum Corp., Tulsa	S half SE, sec. 28-17-14	Comp.	1,000
Mid-Continent Petroleum Corp., Tulsa	W half NW, sec. 17-9-8	Absp.	5,000
Mid-Continent Petroleum Corp., Tulsa	NW, sec. 8-15-6	Absp.	2,000
Mid-Continent Petroleum Corp., Tulsa	NE NW, sec. 12-9-8	Absp.	8,000
Moon Gasoline Co., Tulsa	Sec. 32-15-13	Comp.	500
Moon Gasoline Co., Tulsa	Sec. 4-16-13	Comp.	1,500
National Products Co., 1510 Commonwealth Bldg., Pittsburgh, Pa.	Oilton	Absp.	1,200
National Products Co., 1510 Commonwealth Bldg., Pittsburgh, Pa.	Slick	Absp.	1,200
National Products Co., 1510 Commonwealth Bldg., Pittsburgh, Pa.	Slick	Absp.	1,400
National Products Co., 1510 Commonwealth Bldg., Pittsburgh, Pa.	Slick	Absp.	1,400
Natural Gasoline Corp., Box 1589, Tulsa	Sec. 7-8n-5e, Pottawatomie County	Absp.	35,000
Natural Gasoline Corp., Box 1589, Tulsa	Sec. 31-2s-2w, Carter County	Absp.	12,000
Natural Gasoline Corp., Box 1589, Tulsa	Sec. 30-11n-2w, Oklahoma County	Absp.	15,000
Natural Gasoline Corp., Box 1589, Tulsa	Sec. 20-5s-1e, Carter County	Comp.	*5,000
Neal Gasoline Co., Osage	Sec. 13-21-8	Absp.	4,000
Neal Gasoline Co., Copan	Sec. 32-28-12	Absp.	*1,200
Oil State Gasoline Co.	NE, sec. 7-18n-13e	Comp.	2,500
Oil State Gasoline Co., Jenks	NE, sec. 13-19n-5e	Comp.	2,000
Oklahoma Gasoline Plants, Inc., Drumright	Sec. 18-18-7e	C-A	10,000
Oklahoma Utilities Co., Bristow	Sec. 20-16-9, Creek County	Absp.	5,000
Peppers Gasoline Co., Enid	Enid	Absp.	5,000
Phillips Petroleum Co., Bartlesville	NW SW, sec. 32-11-2w	Absp.	50,000
Phillips Petroleum Co., Bartlesville	NW SW, sec. 33-11-8	Absp.	*20,000
Phillips Petroleum Co., Bartlesville	NE NE, sec. 26-27-5	Absp.	45,000
Phillips Petroleum Co., Bartlesville	SE NW, sec. 24-11-11	Absp.	17,000
Phillips Petroleum Co., Bartlesville	NW NW, sec. 23-7-6	Absp.	20,000
Phillips Petroleum Co., Bartlesville	NW NW, sec. 13-12-2	Absp.	20,000
Phillips Petroleum Co., Bartlesville	S half, sec. 1-11-3	Absp.	60,000
Phillips Petroleum Co., Bartlesville	SW NW, sec. 12-25-11	Absp.	*5,000
Phillips Petroleum Co., Bartlesville	SE SE, sec. 6-24-10	Absp.	14,000
Phillips Petroleum Co., Bartlesville	SW, sec. 16-24-7	C-A	30,000
Phillips Petroleum Co., Bartlesville	SW NW, sec. 33-8-8	Absp.	50,000
Phillips Petroleum Co., Bartlesville	N half NW, sec. 3-9-9	Absp.	30,000
Powers, M. F., Depew	Sec. 8-15-8	Absp.	3,500
Powers & Quinlan, Box 696, Beggs	Sec. 2-14-12	Comp.	800
Powers & Quinlan, Box 696, Beggs	Sec. 5-14-12	Comp.	500
Powers & Quinlan, Box 696, Beggs	Sec. 22-13-14	Comp.	800
Pure Oil Co., Drumright	Sec. 5-17n-7e	Comp.	1,000
Pure Oil Co., Oilton	Sec. 4-18n-7e	Comp.	1,000
Pure Oil Co., Depew	Sec. 8-15n-8e	Comp.	1,000
Pure Oil Co., Seminole	Sec. 26-9n-6e	Comp.	1,750
Reserve Petroleum Co., Box 338, Barnsdall	Barnsdall	Absp.	2,500
Sand Springs Home, Gasoline Department, Sand Springs	Sec. 4-18-7	Comp.	*3,000
Shell Petroleum Corp., Lucien	Sec. 17-20n-3w	Absp.	1,333
Shell Petroleum Corp., Healdton	Sec. 8-4s-3w	Comp.	833
Shell Petroleum Corp., Three Sands	NW, sec. 2-24n-1w	Absp.	7,789
Shell Petroleum Corp., Braman	SW, sec. 21-29n-1w	Absp.	2,142
Shell Petroleum Corp., Braman	NW, sec. 5-28n-1w	Absp.	(*)
Shell Petroleum Corp., Drumright	NE, sec. 8-17n-7e	Absp.	2,545
Shell Petroleum Corp., Maud	SE, sec. 7-8n-5e	Absp.	3,263
Shell Petroleum Corp., Marshall	SE, sec. 19-19n-4w	Absp.	2,706
Silurian Oil Co., Missouri Pacific Bldg., St. Louis	Avant	Comp.	1,388
Sinclair Prairie Oil Co., Box 68, Cleveland	S half SW, sec. 35-21-8	Comp.	3,000
Sinclair Prairie Oil Co., R.F.D. 1, Drumright	SW SW, sec. 28-18-7	Comp.	25,000
Sinclair Prairie Oil Co., Box 578, Shamrock	SW SE, sec. 28-17-7	Comp.	15,000
Sinclair Prairie Oil Co., Box 368, Covington	W half SW, sec. 19-22-3	Absp.	20,000
Sinclair Prairie Oil Co., Box 6, Shidler	SW SE, sec. 29-27-6	Absp.	30,000
Sinclair Prairie Oil Co., Box 865, Seminole	NW NW, sec. 35-9-6	Absp.	70,000
Sinclair Prairie Oil Co., Box 787, Seminole	SW NE, sec. 10-8-6	Absp.	50,000
Sinclair Prairie Oil Co., St. Louis	SW, sec. 24-7-4	C-A	30,000
Sinclair Prairie Oil Co., Box 4188, Capitol Hill, Oklahoma City	SE NW, sec. 30-11-2	Absp.	50,000
Skelly Oil Co., Fairfax	Sec. 3-25n-6e, Osage County	Absp.	15,000
Skelly Oil Co., Carter Nine	Sec. 9-26n-6e, Osage County	Absp.	20,000
Skelly Oil Co., Box 536, Seminole	SW, sec. 17-9n-6e	Absp.	16,000
Skelly Oil Co., Box 157, Lyman	NW, sec. 11-27n-5e	Comp.	5,000
Skelly Oil Co., Jennings	NW SW NW, sec. 15-20n-6e	Absp.	2,000
Skelly Oil Co., Box 168, Slick	NW cor. sec. 15-15n-10e	Absp.	3,000
Skelly Oil Co., Box 413, Wynona	N half SW, sec. 24-24n-9e, Osage County	Absp.	4,200
Skelly Oil Co., Box 487, Fairfax	Sec. 10-25n-6e, Osage County	Comp.	20,000
Southland Gasoline Co., Tulsa	Sec. 33-19-7, Creek County	Absp.	2,000
Stanolind Oil & Gas Co., Philcade Bldg., Tulsa	Tonkawa	Absp.	10,000
Sterling Oil & Gas Co., Tulsa	SE, sec. 1-21-11	Absp.	250
Superior Oil Corp., 315 Exchange Natl. Bank Bldg., Tulsa	NE, sec. 2-9n-5e	Comp.	*10,000
Superior Oil Corp., 315 Exchange Natl. Bank Bldg., Tulsa	NW, sec. 8-9-5	Comp.	*10,000
Test Oil Co., Bartlesville	Sec. 30-27-14	Comp.	*500
Texas Co., The (Delaware), Kiefer	Sec. 8-17n-12e	Comp.	13,900
Texas Co., The (Delaware), Davenport	Sec. 2-14n-5e	Absp.	12,200
Texas Co., The (Delaware), McInnis	Sec. 30-25n-8e	Absp.	5,000
Texas Co., The (Delaware), Maud	Sec. 7-8n-5e†	Absp.	25,000
Tide Water Oil Co. (Okla.), Philcade Bldg., Tulsa	Sec. 8-17n-7e	Absp.	15,000
Utilities Production Corp., Jennings	Sec. 17-20n-7e	Absp.	*600
Victor Gasoline Co., Stroud	Sec. 7-15-7	Absp.	4,000
Victor Gasoline Co., Bristow	Sec. 27-16-9	Absp.	3,000
Warren Petroleum Co., Box 198, Tulsa	Sec. 29-2n-7e, Pontotoc County	Comp.	25,000
Warren Petroleum Co., Box 198, Tulsa	Sec. 15-7n-8e, Hughes County	Comp.	25,000
Warren Petroleum Co., Box 198, Tulsa	Sec. 29-2n-7e, Pontotoc County	Comp.	40,000
Wentz, L. H., Oil Division, Ponca City	Sec. 34-25n-1w	Absp.	5,000
Wentz, L. H., Oil Division, Ponca City	Sec. 17-28n1e	Absp.	3,000
Westoak Gasoline Co., Box 507, Sayre	SE SW, sec. 21-9-23w	Absp.	7,000
Wilcox, H. F., Oil & Gas Co., Tulsa	Sec. 5-8-2	Absp.	*2,500
Wolverine Petroleum Corp., Avant	NE, sec. 12-23n-11e	Absp.	(*)
Wolverine Petroleum Corp., Avant	Sec. 24-24n-11e	Comp.	6,637
Wolverine Petroleum Corp., Wilson	SW, sec. 22-4s-2w	Absp.	4,641
Wright, J. H., estate, Sapulpa	Kellyville	Absp.	5,000

PENNSYLVANIA

Alum Rock Gas Co., Oil City	Fern	Comp.	200
Atlas Oil Co., Clarion	Near Tylersburg	Comp.	350
Barbary & Hardt	Wildwood	Comp.	11
Barlow, Harry T., Petrolia	Petrolia	Comp.	25
Bayliss & Fasenmeyer	Titusville, 2 mi. S	Comp.	1,000
Berry, Pryor	Petrolia	Comp.	25
Brown, Clara, L.	Kinzua	Comp.	100
Buzard Gas Co., Emlenton	Emlenton, 1 mi. E	Comp.	50
Carnahan, Charles E. and Lida M.	Tidioute, ½ mi. W	Comp.	850
Carnegie Natural Gas Co., Lone Pine	Washington County	Absp.	1,000

Company and plant address--	Field location—	Type of plant	Daily cap'y (gals.)
Carnegie Natural Gas Co.	Mount Morris	Absp.	200
Carnegie Natural Gas Co., Waynesburg	Greene County	Absp.	4,500
Carpenter, M. A., Karns City	Fairview Twp.	Comp.	200
Chambers Oil Co.		Comp.	150
Christie & Timblin	Evans City	Comp.	*25
Clinger Oil & Gas Co., Tidioute	Fagundus	Comp.	500
Clinger Oil & Gas Co., Tidioute	Hastings Bridge	Comp.	500
Cochran, John G., Sheffield	Lot 438, Sheffield Twp.	Absp.	1,100
Coffin, C. J., Chicora	Karns City	Comp.	35
Coffin, C. J., Chicora	Chicora	Comp.	35
Columbia Gas & Elec. Corp., McKinley	Elk County	Absp.	1,500
Columbia Gas & Elec. Corp., Majorville	West Twp.	Absp.	7,080
Columbia Gas & Elec. Corp., Waynesville	Franklin Twp.	Absp.	3,930
Columbia Gas & Elec. Corp., Heard	Finley Twp., West County	Absp.	2,550
Conquer, S. J.	Sheffield	Comp.	*80
Cook Oil Lease, Kelletville	Mayburg	Comp.	300
Daugherty, C. R., Y.M.C.A. Bldg., Butler	Herman, Butler County	Comp.	25
Daugherty, C. R. and M. G., Y.M.C.A. Bldg., Butler	Petrolia, Butler County	Comp.	25
Daugherty, C. R., & Co., Y.M.C.A. Bldg., Butler	Oakdale, Allegany County	Comp.	75
Dempseytown Gas Co., Oil City	Leeper	Comp.	150
Dempseytown Gas Co., Oil City	Shippenville	Comp.	100
Dempseytown Gas Co., Oil City	Venus	Comp.	50
Dunlap, Harry G., Chicora	Chicora, 1 mi. W	Comp.	11
Edwards, E. A., Titusville	Titusville	Comp.	170
Eisworth, Hefron & Co.	Lucinda	Comp.	400
Ellenberger, W. J., & Sons		Comp.	300
Elliott Bros.	Chicora	Comp.	500
Equitable Gas Co., Rogersville	Center Twp., Washington County	Absp.	10,000
Equitable Gas Co., R.F.D. 1, Clarksburg, Pa.	Near Zollersville	Absp.	2,000
Federal Oil & Gas Co., McDonald	McDonald	Comp.	100
Fleming, J. E., Titusville	Grand Valley	Comp.	500
Forest Chemical Co., Sheffield	Warren County, Sheffield Twp.	Absp.	*500
Forest Oil & Gas Co., Clinton	Clinton, 3 mi. N	Comp.	300
Gamble, James	Karns City, 1½ mi. E	Comp.	75
Gould, Nancy E., & Son, R.F.D. 6, Butler	Penn Twp.	Comp.	4
Hadden, James B., Sheffield	Henry's Mill	Comp.	100
Hague & Co.	Tidioute	Comp.	500
Haskell Bros., Pleasantville	Southwest Twp., Warren County	Comp.	100
Haskell, Roth & Bayliss, Tidioute	Triumph Twp., Warren County	Comp.	400
Hickey & Rieg, Clarendon	Henry's Mill	Comp.	300
Home Gas Co., Clarion	Highland Twp.	Comp.	.....
Hope Construction & Refining Co.	Brave	Absp.	20,000
Hope Construction & Refining Co.	Imperial	Char.	3,600
Hope Construction & Refining Co.	McKeesport	Char.	*2,600
Hope Construction & Refining Co.	Mayport	Absp.	1,500
Hope Construction & Refining Co.	Yatesboro	Absp.	*900
Hunter, Livingston L. Trust, Tidioute	Trunkeyville, Forrest County	Comp.	*300
Jackson, Fred W.	Chicora	Comp.	360
Jennings, E. H., Bros. Co., 608 Columbia Bldg., Pittsburgh	Fayette Twp., Allegheny County	Comp.	1,000
Jennings, E. H. Bros. Co., 608 Columbia, Bldg., Pittsburgh	Fayette Twp., Allegheny County	Comp.	150
Johnson, C. H., and H. G. Dunlap	Chicora	Comp.	60
Kapp & Brocklehurst, Tidioute	Tidioute	Comp.	200
McMeekin, Chas. T., Karns City	Karns City, 1½ mi. SW	Comp.	50
Mars Oil Co. (The), Oil City	Endeavor	C-A	*1,500
Mars Oil Co. (The), Oil City	Lewis Run	C-A	*6,500
Mars Oil Co. (The), Oil City	c/o Hampton St., Pinegrove Twp.	C-A	4,000
Mars Oil Co. (The), Oil City	Van	C-A	7,500
Mars Oil Co. (The)	Clarion	C-A	*1,800
Master & Hess, Inc.	Fern, 1 mi. W	Comp.	100
Montgomery, James, R.F.D. 1, McCoy Road	McKee's Rocks	Comp.	100
Moore, Way & Harrison	Titusville, 7 mi. N	Comp.	150
Myers Bros. & Hazzard	Tidioute, 1 mi. N	Comp.	100
National Gasoline Co.	Grand Valley	Comp.	250
National Gasoline Co.	West Hickory	Comp.	250
North Penn Gas Co., 103 Mill St., Port Allegany	Shinglehouse	Absp.	*600
O'Hara, Sarah C., 218 E. North St., Butler	Fairview Twp.	Comp.	100
Pennsylvania Fuel Supply Co.	Clarion	C-A	*800
Pennsylvania Oil Co.	Sheffield	C-A	10,000
Pittsburgh Oil & Gas Co., 1005 Farmers Bank Bldg., Pittsburgh	Miola	Comp.	100
Pittsburgh Oil & Gas Co., 1005 Farmers Bank Bldg., Pittsburgh	Clarion	Comp.	100
Porter Bros., Catfish	Catfish, 1 mi. E	Comp.	100
President Oil Co., Emlenton	Bruin, 2 mi. W	Comp.	50
President Oil Co., Emlenton	Emlenton, 2 mi. SW	Comp.	20
President Oil Co., Emlenton	Fryburg, 6 mi. N	Comp.	300
Price, Harry D., Renfrew	Butler Twp., Butler County	Comp.	35
Ramage, S. Y., Oil City	Venango County	Comp.	100
Ramage, S. Y., Oil City	Warren County	Comp.	50
Red Brush Oil Co., Tidioute	6 mi. S Tionesta	Comp.	40
Riddle Farm Oil Co., Karns City	½ mi. S Karns City	Comp.	50
Ritzert Bros., Chicora	Chicora	Comp.	70
Sand Hill Lease, Tidioute	Perry Twp., Armstrong	Comp.	100
Say, George K., R.F.D. 2, Karns City	Triumph Twp., Warren County	Comp.	40
Sloan & Zook Co., Kane	Kane	Absp.	1,500
South Penn Oil Co., Pittsburgh	Evans City	Comp.	150
South Penn Oil Co., Pittsburgh	Badon	Comp.	50
South Penn Oil Co., Pittsburgh	Bradford	Comp.	550
South Penn Oil Co., Pittsburgh	South Heights	Comp.	550
South Penn Oil Co., Pittsburgh	Campbell	Comp.	150
South Penn Oil Co., Pittsburgh	Evans City	Comp.	450
South Penn Oil Co., Pittsburgh	Guffey	Comp.	150
South Penn Oil Co., Pittsburgh	Henry's Mill	Comp.	300
South Penn Oil Co., Pittsburgh	Kane	Comp.	100
South Penn Oil Co., Pittsburgh	Wright	Comp.	550
South Penn Oil Co., Pittsburgh	New Freeport	Absp.	1,000
South Penn Oil Co., Pittsburgh	Noblestown	Comp.	1,600
South Penn Oil Co., Pittsburgh	Evans City	Comp.	125
South Penn Oil Co., Pittsburgh	Parker's Landing	Comp.	50
South Penn Oil Co., Pittsburgh	President	Comp.	500
South Penn Oil Co., Pittsburgh	Tiona	Comp.	450
South Penn Oil Co., Pittsburgh	Yorkey	Comp.	650
South Penn Oil Co., Pittsburgh	Sturgeon	Comp.	1,500
South Penn Oil Co., Pittsburgh	Noblestown	Comp.	125
Stephens, W. J., Grand Valley	Grand Valley	Comp.	100
Success Oil Co., Titusville	Pioneer	Comp.	2,000
Surety Oil Co., Titusville	2½ mi. S Titusville	Comp.	1,000
Tarbell & Co., Grand Valley	2 mi. from Grand Valley	Comp.	80
Thomas, R. L., Tidioute	Middle field	Vac.	250
Tompsett Bros., Tidioute	Triumph Twp.	Comp.	500
Triangle Co., McKees Rocks	Pine Hollow Road	Comp.	350
Triumph Petroleum Co., Route 3, Tidioute	Triumph Twp., Warren County	Comp.	175
Union Gasoline & Oil Corp., Honst	Clarion	C-A	*800
Vogebacker, A. J. and J. E.	Lucinda	Comp.	42
Wahl, A. R., Evans City	Wahl farm, Forward Twp.	Comp.	150
Warner-Caldwell Oil Co., R.F.D. 2, Titusville	Titusville	Comp.	1,000
Wheeler, D. H., Box 86, Petrolia	Petrolia, 1½ mi. SE	Comp.	200
Will, Jacob W., McDonald	Canonsburg	Comp.	55

TEXAS

Company and plant address—	Field location—	Type of plant	Daily cap'y (gals.)
Airolene Gasoline Corp., Kennedy Bldg., Tulsa, Okla.	Sec. 9, Blk. 27, Magic City R.R. Sur.	Absp.	5,000
American Natural Gasoline Co., Box 198, Tulsa, Okla.	Sec. 100, Blk. 23, H.&G.N. Sur.	Absp.	60,000
Aran Gasoline Corp., Eastland	SE, sec. 17, Blk. 4, H.& T.C. Ry. Sur.	Absp.	25,000
Arab Gasoline Corp., Eastland	NW, sec. 11, Blk. 4, H.& T.C. Ry. Sur.	Absp.	*10,000
Arkansas Fuel Oil Co., Shreveport, La.	Castleberry H.R.S., Gregg County	Absp.	25,000
Barker & Goforth	Ranger, 5 mi. W	Absp.	*1,500
Big Lake Oil Co., Texon	Sec. 2, Blk. 2, Reagan County	Absp.	50,000
Breckenridge Gasoline Co., Breckenridge	Breckenridge	Absp.	12,000
Buckeye Natural Gasoline Corp., Magic City	SE, sec. 41, Blk. 24, Wheeler County	Absp.	15,000
California United Gasoline Corp., Coleman	Overall ranch	C-A	10,000
California United Gasoline Corp., Coleman	Weaver ranch	C-A	10,000
Canadian River Gas Co., Colorado Springs, Colo.	Sec. 33, Blk. P. Mc., E.L. R.R. Sur., Moore County	Absp.	30,000
Cannon Gasoline Co., Box 963, Amarillo	2½ mi. N Amarillo	Absp.	5,000
Cargray Corp., Amarillo, Tex.	Sec. 46, Blk. 4	Absp.	100,000
Chief Refining Co., Gladewater	Johnson lse., M. Dillard Sur.	Comp.	5,000
Clymore Co., Inc., Corpus Christi	Refugio	Absp.	30,000
Coltexo Corp., Lefors	NW sec. 2, Blk. 1, A.C.H.&B. Sur., Gray County	Absp.	20,000
Coltexo Corp., Lefors	NE, sec. 1, H.&G.N., Blk. B-2, Gray County	Absp.	20,000
Coltexo Corp., Lefors	B.&B. Sur., sec. 2, Gray County	Absp.	*10,000
Columbian Gasoline Corp., Shamrock	Sec. 46, H.&G.N., Blk. 17, Wheeler County	Absp.	5,000
Consolidated Gasoline Co., Eastland	Eastland, 2 mi. SW	Absp.	12,000
Crawford Gasoline Co., New York City	Skellytown	Absp.	5,000
Crescent Gasoline Co., Overton	Overton	Comp.	7,000
Empire Oil & Refining Co., Pampa, Tex.	NE, sec. 152, Blk. 3	Absp.	30,000
Excelsior Refining Co., Henderson, Tex.	M. J. Pru Sur., 9 mi. from Henderson	Absp.	20,000
Gilliland Refining Co., Gladewater	Gladewater	Comp.	10,000
Gilliland Refining Co., Gladewater	Kilgore		(*)
Gladewater Gasoline Co., Gladewater	J. S. Crosby Sur.	Comp.	16,000
Graham Oil & Gas Co., Graham	Morrison farm	Absp.	8,000
Gregg County Gasoline Co., Gladewater	E. L. Walker Sur.	Comp.	5,000
Gregg-Tex Gasoline Corp., Longview	NE Sanchez Sur., Gregg County	Comp.	40,000
Hanlon Gasoline Co., Tulsa, Okla.	2 mi. S Breckenridge	Absp.	50,000
Hanlon Gasoline Corp. of Texas	Near Gladewater	Absp.	75,000
Henderson Co., Sanford	Sanford	Absp.	25,000
Hercules Gasoline Co., Gladewater	Mary Van Winkle Sur.	Comp.	35,000
Huber, J. M., Petroleum Co., Box 278, Borger	Sec. 28, Blk. Y	Absp.	25,000
Humble Oil & Refining Co., Rising Star	Brown County	Absp.	10,000
Humble Oil & Refining Co., Neches	Anderson County	C-A	7,500
Humble Oil & Refining Co., Overton	Rusk County	Absp.	23,500
Humble Oil & Refining Co., Overton	Rusk County	Absp.	43,500
Humble Oil & Refining Co., Bellville	Austin County	Absp.	10,000
Humble Oil & Refining Co., Conroe	Montgomery County	Absp.	20,000
La Salle Petroleum Co., Burkburnett	Burkburnett	Comp.	*8,000
Lisbon Gasoline Co., Inc., Shreveport	Rusk County	Comp.	15,000
Lisbon Gasoline Co., Inc., Shreveport	1 mi. W Carlisle	Comp.	15,000
Lone Star Gas Co., Petrolia	3 mi. S Petrolia	Absp.	15,000
Lone Star Gas Co., Trinidad	1½ mi. S Trinidad	Absp.	40,000
Lone Star Gas Co., Gordon	2 mi. E Gordon	Absp.	25,000
Lone Star Gas Co., Box 488, Ranger	9 mi. S Ranger	Comp.	3,000
Lone Star Gas Co., R.F.D. 1, Cisco	7 mi. SE Moran	Absp.	5,000
Lone Star Gasoline Co., Box 788, Ranger	Ranger (3)	Absp.	65,000
Lone Star Gasoline Co., Box 788, Ranger	Eastland	Absp.	6,500
Lone Star Gasoline Co., Drawer 90, Breckenridge	Breckenridge	Absp.	31,000
Magnolia Petroleum Co., Box 308, Electra	J. G. Hardin Lse., Wm. Dubose Sur.	Comp.	3,000
Magnolia Petroleum Co., Electra	Sec. 17, Blk. 13, H.&T.C. Ry. Sur.	Comp.	5,000
Magnolia Petroleum Co., Olden	R. S. Harris farm, Matt Finch Sur.	Absp.	5,000
Magnolia Petroleum Co., Olden	Caruth farm, Smelzer Sur.	Comp.	6,000
Magnolia Petroleum Co., Pampa	NE, sec. 82, Blk. 3, I.&G. N. Ry. Sur.	Absp.	*4,250
Magnolia Petroleum Co., Pampa	Sec. 39, Blk. B-2, H.&G. N. Ry. Sur.	C-A	9,500
Magnolia Petroleum Co., Pampa	Sec. 29, Blk. 4, I.&G.N. Ry. Sur.	Absp.	5,000
Magnolia Petroleum Co., Pampa	NE, sec. 39, Blk. 24, H. &G.N. Sur.	Absp.	*2,000
Magnolia Petroleum Co., Pampa	Sec. 152, Blk. 3, I.&G.N. Sur.	Absp.	7,500
Magnolia Petroleum Co., Olden	C. B. Brown farm, sec. 18, Stephens County	Absp.	(*)
Magnolia Petroleum Co., Olden	A. M. Sullivan farm, Stephens County	Comp.	(*)
Magnolia Petroleum Co., Olden	J. M. Rush farm, sec. 13, Stephens County	Comp.	(*)
Marathon Oil Co., Thompson Bldg., Tulsa, Okla.	J. W. Hill lease, Stephens County, Eliasville	Absp.	10,000
Marathon Oil Co., Thompson Bldg., Tulsa, Okla.	Tullos lease, Stephens County, Eliasville	Absp.	10,000
Marr Natural Gasoline Co., Box 187, Tyler	L. N. Sparks Sur.	Absp.	2,000
Midland Gasoline Co., Box 338, Conroe	Conroe field, Montgomery County	Absp.	10,000
Natural Gasoline Corp., Box 1589, Tulsa, Okla.	Chas. Betts Sur. No. 625, Brown County	Absp.	20,000
Nine Oaks Gasoline Corp., Gladewater	Gladewater	Comp.	1,000
Omar Gasoline Co., Wichita Falls	NW of Burkburnett	Comp.	11,500
Parade Gasoline Co., Inc., Overton	C. C. and J. E. Giles lease, Joiner area, Rusk County	Absp.	45,000
Phillips Petroleum Co., Belico	NE NW sec. 51, H.&G.N Sur., Wheeler County	Absp.	12,000
Phillips Petroleum Co., Bowers	W half, sec. 62, H.&G.N. Sur., Blk. B-2, Gray County	Absp.	50,000
Phillips Petroleum Co., Canadian	NW SE, sec. 1, Blk X02, Hutchinson County	Absp.	20,000
Phillips Petroleum Co., Carson	W. central, sec. 115, I.&G. N. Sur., Blk. 5, Carson County	Absp.	20,000
Phillips Petroleum Co., Eliasville	6.58 ac. N. half, Sur. 1,174 T.E.&L., Stephens County	Absp.	12,000
Phillips Petroleum Co., Frankell	Sec. 51, T.&P. Sur., Blk. 6, Stephens County	Absp.	5,500
Phillips Petroleum Co., Gorman	SE cor. Thos. Mulryne Sur. A-377, H.&T.C., Blk. 1, Eastland County	Absp.	5,000
Phillips Petroleum Co., Gray	E half, Sec. 32, H.&G.N. Sur., Blk. 2, Gray County	Absp.	100,000
Phillips Petroleum Co., Helios	W. A. Eaken, 132-ac. tract, Eastland County	Absp.	15,000
Phillips Petroleum Co., Herron City	SE, sec. 20, P. J. Humphrey Sur. A-153	Absp.	5,000
Phillips Petroleum Co., Hohertz	12 ac., sec. 62, Blk. 4, T.&P.R.R. Sur., Stephens County	Absp.	5,000

Company and plant address—	Field location—	Type of plant	Daily cap'y (gals.)
Phillips Petroleum Co., Ibex	NW, sec. 23, Blk. AL, Shackelford County	Absp.	20,000
Phillips Petroleum Co., Johnson	Con. 60 ac., S half, sec. 69, Blk. 46, H.&T.C. Sur., Hutchinson County	Absp.	50,000
Phillips Petroleum Co., Judkins	W 60 ac., N half S half sec. 1, University land, Ector County	Absp.	15,000
Phillips Petroleum Co., Lefors	NE NE, sec. 56, Blk. 25, H.&G.N. Sur., Gray County	Absp.	15,000
Phillips Petroleum Co., McCamey	NE NE, sec. 216, C.C. S.D.&R.G.N.G.R.R. Sur., Blk. F, Crane County	Absp.	50,000
Phillips Petroleum Co., North	SW, sec. 35, and NW Sec. 36, L&G.N. Sur., Blk. 3, Gray County	Absp.	60,000
Phillips Petroleum Co., Pampa	W half SW, sec. 88, H.& G.N. Sur., Blk. B-2, Gray County	Absp.	60,000
Phillips Petroleum Co., Panhandle	SW, sec. 113, L&G.N.R.R. Sur., Blk. 5, Carson County	Absp.	15,000
Phillips Petroleum Co., Pantex	SE cor. Mary Whitley Sur., Blk. 8, Hutchinson County	Absp.	50,000
Phillips Petroleum Co., Rock Creek	N half NW, sec. 32, Blk. Y, A.&B. Sur., Hutchinson County	Absp.	60,000
Phillips Petroleum Co., South Bend	20 ac., N. centr. J. Garrett Sur. A-108, Young County	Absp.	9,000
Phillips Petroleum Co., Sanford	Sec. 91, Blk. 46, H.&T.C. R.R. Sur., Hutchinson County	Absp.	26,000
Phillips Petroleum Co., Texroy	SE. sec. 3, Blk. B-3, D.& S.E.R.R. Sur., Hutchinson County	Absp.	50,000
Pure Oil Co., Van	Van Zandt County	C-A	15,500
Red River Oil Co., Box 712, Tulsa, Okla.	Electra	Comp.	5,000
Roeser & Pendleton, Inc., Fort Worth	NE sec. 84, E.T. Ry. Sur., Shackelford County	Absp.	30,000
Roeser & Pendleton, Inc., Fort Worth†	Reynolds ranch, Shackelford County, 7 mi. NW Albany	Absp.	30,000
Sabine Valley Gasoline Co., Inc., Longview	Mary Scott Sur., Laura Howard tract, Gregg County	Comp.	42,000
Shamrock Oil & Gas Co., Lefors	Sec. 50, Blk. 25, H.&G.N. Sur.	Absp.	10,000
Shamrock Oil & Gas Co., Sunray	Sec. 399, Blk. 44, H.&T.C. Sur., Moore County	Absp.	7,500
Shell Petroleum Corp., Skellyville	SW 113, Blk. 4, L&G.N. Sur.	Absp.	3,985
Shell Petroleum Corp., Pampa	SW, sec. 83, Blk. 3, L& G.N. Sur.	Absp.	5,945
Shell Petroleum Corp., Skellytown	SE. sec. 107, Blk. 4, L& G.N. Sur.	Absp.	8,409
Signal Oil Co., Box 157, Best	Best, Reagan County	Absp.	50,000
Sinclair Prairie Oil Co., Box 1674, Longview	J. Mosely Sur.	C-A	50,000
Sinclair Prairie Oil Co., Drawer CC, Arp	Rich. McAnulty Sur., Florence Wilson lease	C-A	40,000
Skelly Oil Co., Box 178, Stinnett	NW cor. Matilda Robinson Sur., Moore County	Absp.	5,500
Skelly Oil Co., Box 128, Skellytown	NE. sec. 174, Blk. 3	Absp.	*15,000
Skelly Oil Co., Box 336, Whittenburg	SW. sec. 4, Blk. B-4, D.& S.E. Ry. Sur.	Absp.	9,556
Skelly Oil Co., Box 816, Burkburnett	Burkburnett Townsite	Comp.	5,500
Skelly Oil Co., Box 128, Skellytown	S half, sec. 88, Blk. 4, L&G.N. Sur.	Absp.	35,000
Skelly Oil Co., Box 128, Skellytown	Sec. 86, Blk. 4, L&G.N. Ry. Sur., Carson County	Char.	*3,000
Skelly Oil Co., Box 127, Skellytown	Sec. 124, Blk. 4, L&G.N. Sur., Carson County	Absp.	5,000
Smith Brothers Refining Co., McLean	McLean	Absp.	40,000
Southern Gasoline Co., Ranger	Tiffin	Absp.	2,500
Stanolind Oil & Gas Co., Desdemona	Desdemona No. 5	Comp.	10,000
Stanolind Oil & Gas Co., Desdemona	Desdemona No. 6	Absp.	10,000
Sunray Oil Co., Tulsa, Okla.	Sunray, Moore County	Absp.	18,000
Texas Co., The (Delaware), Electra	¼ mi. NW Electra	Comp.	9,200
Texas Co., The (Delaware), Burkburnett	3 mi. NW Burkburnett	Comp.	33,000
Texas Co., The (Delaware), Olney	2½ mi. NE Olney	Comp.	7,000
Texas Co., Foard City	15 mi. NW Foard City	Comp.	10,000
Texas Gasoline Co., Desdemona	1½ mi. from Desdemona	Absp.	2,000
Texas Pacific Coal & Oil Co., Fort Worth	Caddo	Absp.	10,000
Texas Pacific Coal & Oil Co., Fort Worth	Eliasville	Absp.	10,000
Texas Pacific Coal & Oil Co., Fort Worth	Strawn	Absp.	5,000
Texoma Natural Gas Co., 20 N. Wacker Drive, Chicago, Ill.	Fritch, sec. 5, T.T.R.R. Sur., Blk. ¼	Absp.	65,500
Tucker Oil Co., Wichita Falls	Blk. 93, R.R.V. Lds. Sur., Wichita County	Comp.	5,000
United Gas Public Service Co., Box 2492, Houston	Jane Thorpe Sur., Panola City	Absp.	5,000
United Gas Public Service Co., Box 2492, Houston	Refugio field	Absp.	25,000
Waggoner Gasoline Co., Electra	Sec. 33, Blk. 4, Wilbarger County	Absp.	25,000
Western Oil Corp. of Texas, Philcade Bldg., Tulsa, Okla.	Electra	Comp.	2,000
West Texas Gas Co., Lubbock	Sec. 45, Blk. 2, A.G.&M. Sur.	Absp.	10,000
Wilcox, H. F., Oil & Gas Co., Tulsa, Okla.	Sec. 61, Blk. 3, I.&G.N. Sur.	Absp.	5,000

*Building.
†Owned jointly with Continental Oil Co.

WEST VIRGINIA

Company and plant address—	Field location—	Type of plant	Daily cap'y (gals.)
American Oil Development Co., Pittsburgh, Pa.	Tyler County	Comp.	1,000
American Oil Development Co., Pittsburgh, Pa.	Pleasants County	Comp.	100
American Oil Development Co., Pittsburgh, Pa.	Tyler County	Comp.	100
Blue Creek Oil & Gas Co., Charleston	Blue Creek	Comp.	2,500
Carbide & Carbon Chemicals Corp., 30 E. 42nd St., New York, N. Y.	Hastings	Comp.	1,000
Carbide & Carbon Chemicals Corp., 30 E. 42nd St., New York, N. Y.	Diamond	Comp.	2,500
Carnegie Natural Gas Co., Hundred	Hundred	Absp.	3,300
Carnegie Natural Gas Co., Pine Grove	Pine Grove	Absp.	3,000
Carnegie Natural Gas Co., Underwood	Underwood	Absp.	3,000
Carnegie Natural Gas Co., Woodruff	Woodruff	Absp.	1,800
Carnegie Natural Gas Co., Toll Gate	Ritchie County	Absp.	.....
Castle Oil Co., 318½ Juliana St., Parkersburg	Pleasants and Tyler Counties	Comp.	250
Chemical Oil & Gas Co., Big Bend	Grantsville	C-A	500
Cumberland & Allegheny Gas Co.	Jane Lew, 3 mi. S	Absp.	3,000
Dinsmoor & Co., St. Marys	Pleasants County	Comp.	346
Dun Mar Oil & Gas Co., Route 3, Fairview	Jarke Run	Comp.	50
Falling Rock Cannel Coal Co.	Weir	Absp.	3,000
Federal Oil & Gas Co., Elizabeth	Elizabeth, S	Comp.	250
Federal Oil & Gas Co., Weston	Weston, 5 mi.	Comp.	500
Hapgood, R. T., & Co., Charleston	Cedar Grove	Char.	3,500
Henaghan & Hanlon, Inc., Sistersville	Harrisville	Comp.	1,000
Henaghan & Hanlon, Inc., Sistersville	Harrisville	Comp.	5,000
Henaghan & Hanlon, Inc., Sistersville	Hebron	Comp.	3,000
Henaghan & Hanlon, Inc., Sistersville	Rock Run	Comp.	1,000
Henaghan & Hanlon, Inc., Sistersville	Highland	Comp.	2,000
Henaghan & Hanlon, Inc., Sistersville	Highland	Comp.	12,000
Henaghan & Hanlon, Inc., Sistersville	Finch	Comp.	1,000
Henaghan & Hanlon, Inc., Sistersville	Pike	Comp.	1,500
Henaghan & Hanlon, Inc., Sistersville	Pike	Comp.	3,000
Henaghan & Hanlon, Inc., Sistersville	West Union	Comp.	500
Hope Construction & Refining Co.	Barren Creek	Absp.	*12,000
Hope Construction & Refining Co.	Bristol	Absp.	3,000
Hope Construction & Refining Co.	Littleton	Absp.	*15,000
Hope Construction & Refining Co.	Mount Clair	Absp.	2,500
Hope Construction & Refining Co.	Pine Grove	Absp.	40,000
Hope Construction & Refining Co.	Rachel	Absp.	*10,000
Hope Construction & Refining Co.	Salem	Absp.	4,000
Hope Construction & Refining Co.	Spencer	Absp.	*1,000
Hope Construction & Refining Co.	Waverly	Absp.	5,000
Jennings Oil Co., 608 Columbia Bldg., Pittsburgh	Wetzel County	Comp.	100
Kanawha Oil Co., 2009 Clark Bldg., Pittsburgh	Wetzel County	C-A	1,200
Kanawha Oil Co., 2009 Clark Bldg., Pittsburgh	Wetzel County	Comp.	300
Melrose Oil & Gas Co., Sistersville	Stealey farm	Comp.	25
Melrose Oil & Gas Co., Sistersville	Gorrell farm	Comp.	25
New York Petroleum Co., Box 563, Parkersburg	Ritchie County	Comp.	350
Oil & Gas Co., 318½ Juliana St., Parkersburg	Ritchie County	Comp.	250
Owens, Libbey-Owens Gas Dept., Charleston	South Malden, Kanawha County	Absp.	10,000
Pure Oil Co., Dawes	Kanawha County	Absp.	18,000
Ramage, S. Y., Oil City	Pleasants County	Comp.	50
Reno Oil Co., Sistersville	Tyler County	Comp.	50
Reno Oil Co.	Ritchie County	Comp.	33
Reno Oil Co.	Tyler County	Comp.	44
Reno Oil Co.	Ritchie County	Comp.	50
Reno Oil Co.	Ritchie County	Comp.	75
Reserve Gas Co., Box 1756, Pittsburgh, Pa.	Valley Chapel	Absp.	20,000
Pittsburgh Oil & Gas Co., 1005 Farmers Bank Bldg., Pittsburgh, Pa.	Sistersville, Tyler County	Comp.	750
Pittsburgh Oil & Gas Co., 1005 Farmers Bank Bldg., Pittsburgh, Pa.	Porters Falls, Wetzel County	Comp.	*100
Pittsburgh Oil & Gas Co., 1005 Farmers Bank Bldg., Pittsburgh, Pa.	Macfarlan, Ritchie County	Absp.	*1,500
South Penn Oil Co., Pittsburgh, Pa.	Alvy	Comp.	1,500
South Penn Oil Co., Pittsburgh, Pa.	Bulls Mills	Comp.	500
South Penn Oil Co., Pittsburgh, Pa.	Blue Creek	Comp.	1,700
South Penn Oil Co., Pittsburgh, Pa.	Blue Creek	Comp.	3,000
South Penn Oil Co., Pittsburgh, Pa.	Bula (near Wana)	Comp.	400
South Penn Oil Co., Pittsburgh, Pa.	Clay	Comp.	3,200
South Penn Oil Co., Pittsburgh, Pa.	Coco	Comp.	3,300
South Penn Oil Co., Pittsburgh, Pa.	Fink	Comp.	1,000
South Penn Oil Co., Pittsburgh, Pa.	Glenville	Comp.	1,100
South Penn Oil Co., Pittsburgh, Pa.	McFarlin	Comp.	2,000
South Penn Oil Co., Pittsburgh, Pa.	Mannington	Comp.	1,500
South Penn Oil Co., Pittsburgh, Pa.	Metz	Comp.	1,500
South Penn Oil Co., Pittsburgh, Pa.	Pine Grove	Comp.	2,500
South Penn Oil Co., Pittsburgh, Pa.	Shirley	Comp.	500
South Penn Oil Co., Pittsburgh, Pa.	Shirley	Comp.	1,200
South Penn Oil Co., Pittsburgh, Pa.	Smithfield	Comp.	3,000
South Penn Oil Co., Pittsburgh, Pa.	Spencer	Comp.	2,000
South Penn Oil Co., Pittsburgh, Pa.	Statler Run	Comp.	2,200
South Penn Oil Co., Pittsburgh, Pa.	Walton	Comp.	2,400
South Penn Oil Co., Pittsburgh, Pa.	Wolf Summit	Comp.	2,000
South Penn Oil Co., Pittsburgh, Pa.	Yawkey	Comp.	3,000
Sutton Bros., Inc., Steubenville, Ohio	Hancock County	Comp.	*200
Tyler Oil Co., Sistersville	Tyler County	Comp.	49
Tyler Oil Co., Sistersville	Tyler County	Comp.	35
Tyler Oil Co., Sistersville	Tyler County	Comp.	24
Union Gasoline & Oil Corp., Porters Falls	Wetzel County	Absp.	7,000
Union Gasoline & Oil Corp., Moundsville	Marshall County	Absp.	3,000
Union Gasoline & Oil Corp., Jane Lew	Lewis County	Absp.	*3,000
Union Gasoline & Oil Corp., Sedalia	Doddridge County	Absp.	*3,000
Viking Gasoline Corp., Charleston	Morgantown	Char.	1,000
Viking Realty Co., Martha	Cabell County	Char.	1,000
Virginian Gasoline & Oil Co., Sandyville	Jackson County	Char.	40,000
Virginian Gasoline & Oil Co., Ona	Cabell County	Absp.	*18,000
Virginian Gasoline & Oil Co., Charleston	Kanawha County	Absp.	15,000
Virginian Gasoline & Oil Co., Clendenin	Kanawha County	Absp.	40,000
Virginian Gasoline & Oil Co., Charleston	Kanawha County	Char.	2,000
Virginian Gasoline & Oil Co., Spencer	Roane County	Char.	12,000
Virginian Gasoline & Oil Co., St. Albans	Kanawha County	Char.	3,500
Virginian Gasoline & Oil Co., Louisia, Ky.	Wayne County	Char.	*3,500
Virginian Gasoline & Oil Co., Hubball	Lincoln County	Char.	12,000
Virginian Gasoline & Oil Co., Mammoth	Kanawha County	Absp.	2,500
Virginian Gasoline & Oil Co., Stoffel	Kanawha County	Absp.	1,500
Virginian Gasoline & Oil Co., Three Mile	Kanawha County	Absp.	3,500
Virginian Gasoline & Oil Co., Pad	Roane County	Absp.	800
Watson, G. L., Parkersburg	Belmont	Comp.	50
Wahl, A. R., Evans City	Foward Twp., Butler County	Comp.	150
Wiser Oil Co., Sistersville	Roane County	Comp.	100

WYOMING

Company and plant address—	Field location—	Type of plant	Daily cap'y (gals.)
Continental Oil Co., Denver, Colo.	Natrona County	Absp.	6,000
Ohio Oil Co., Manville	Niobrara County	Absp.	7,500
Ohio Oil Co., Rock River	Carbon County	Absp.	4,500
Ohio Oil Co., Kirby	Hot Springs	Comp.	7,500
Producers & Refiners Corp., Casper	NW, sec. 7-26-89	Absp.	15,000
Sinclair Wyoming Oil Co., Bairoil	NE, sec. 10-26n-90w	Comp.	1,200
Sinclair Wyoming Oil Co., Bairoil	NE SW sec. 7-26n-89w	Absp.	5,000
Sinclair Wyoming Oil Co., Bairoil	NE, sec. 13-39n-79w, Natrona	Absp.	10,000
Standard Engineering Corp., Box 1739, Casper	Casper	Absp.	2,500
Stanolind Oil & Gas Co., Tulsa, Okla.	Midwest	Comp.	130,000
Stanolind Oil & Gas Co., Tulsa, Okla.	Elk Basin	Comp.	*2,000

Crude Oil Stocks

Stocks of domestic and foreign crude petroleum at the close of the week ending April 25 totaled 313,132,000 bbls., according to data compiled by the Bureau of Mines, an increase of 87,000 bbls., comprising an increase of 139,000 bbls. in stocks of foreign crude but a decrease of 52,000 in stocks of domestic crude.

Grade of crude oil—	April 18	April 25
Pennsylvania Grade	4,129,000	4,161,000
Other Appalachian	950,000	918,000
Lima-Northeast Indiana-Michigan	1,291,000	1,286,000
Illinois-Southwest Indiana	10,550,000	10,536,000
North Louisiana and Arkansas	10,096,000	10,128,000
West Texas and Southeast New Mexico	28,399,000	28,754,000
East Texas	20,672,000	20,678,000
Other Mid-Continent	128,296,000	127,572,000
Gulf Coast	26,908,000	27,048,000
Rocky Mountain	26,474,000	26,438,000
California	35,253,000	35,396,000
Foreign	3,277,000	3,416,000
Total reported weekly	296,295,000	296,332,000
Estimate of unreported stocks	16,750,000	16,800,000
Total stocks	313,045,000	313,132,000

West and North Texas

By L. E. BREDBERG

PERMIAN BASIN EXTENSIONS; RAIN HELPS IN NORTH TEXAS

FORT WORTH, Tex., May 11.—A south and west extension to the southern Ward County producing area, a new well that proved up a gap between wells in the Kermit area, Winkler County, and another producer for the recently extended Goldsmith area in Ector County, were the features in the Permian Basin of West Texas this week. Another mile north extension to a recently extended area in northern Winkler was proven when a deepened gasser showed for an oil producer.

Wahlenmaier and Atlantic Oil Producing Co. No. 1-A Leck, located in the SW quarter of section 34, Block 74, P.S.L. Survey, northern Winkler County, proved a feature in the Permian Basin this week when it was shut in for storage after deepening and showing for an oil producer. This well was previously completed as a gasser, making 3,650,000 feet per day at total depth of 2,883 feet, but after a well was completed in section 9, Block 26, about three weeks ago, 2½ miles north of the Hendricks field, the owners of the gasser decided to deepen it in an effort to pick up the pay found in the Uscan-Humble well which is a little over a mile to the southwest. The Leck well responded satisfactorily. It struck saturated lime between 3,020 and 3,068 feet and is being tested at total depth of 3,070 feet, waiting on storage, sure of making a producer and proving up more oil territory, and extending the Hendricks and the Sayre-Howe areas. It is located 1 mile west of Gulf Oil Corp. No. 1-A Daugherty, 1 mile to the east in section 35, a west edge producer to the Sayre-Howe area.

In this same area, the Uscan Oil Co. has completed an east offset to its former extension well in the NE cor. section 9. The new well is in the NW cor. section 10, Block 26. It made 1,690 bbls. on a 24-hour proration test, through 2-inch tubing choke. Total depth is 3,051 feet. Both wells are on leases farmed out by the Humble Oil & Refining Co. to R. H. Henderson and others, and proved important lime extensions.

Pete Booth, scout for Humble Oil & Refining Co. at Cisco, Tex., and head of the Cisco Oil Scouts

Another important well for Winkler County is Bert Fields No. 1 Clapp on acreage farmed out by the Pure Oil Co. This well is located in section 26, Block 26, about midway, one-half mile, between the new extension of Illinois Oil Co. and Humble Oil & Refining Co. No. 1-A Colby. It started flowing 10 bbls. of oil per hour, with 4,000,000 feet of gas at 2,976 feet. The sandy lime pay was topped at 2,830 feet and an increase registered at 2,955-76 feet. It fills in an important gap between the other two extension producers. After shooting with 350 quarts of nitroglycerin at 2,800-3,035 feet, it flowed 230 bbls. of oil, with 4,000,000 feet of gas, in 10 hours. Potential test is now being made.

The McCurdy extension in section 10, Block B-3, was shot this week with 330 quarts at 2,780-2,965 feet and flowed 1,135 bbls. of oil in 24 hours through the casing. Total depth is 2,968 feet. It extended the Kermit area one-half mile to the east.

Another interesting extension to the Kermit and Sayre-Howe areas is that of the Mid-Continent Petroleum Corp. on the Walton ranch. Location is in the SE cor. NW section 24, Block 26, about midway between the two producing areas and will prove another link between them. It logged the pay from 2,850-60 feet and started flowing 27 bbls. per hour while drilling ahead at 2,930 feet in lime. However, in drilling to 2,980 feet it showed no increase so was shut down to shoot the pay horizon to stimulate the flow.

Kimble County Wildcat

An Ordovician test is to be drilled in section 47, B.S.&S.F. Survey, in the north central part of Kimble County, by Dr. B. D. Thomas of Dallas, who acquired some 8,000 acres from the Maverick Oil Co. for drilling the test. Cable tools are now being rigged up on the location and the hole is to go to 3,800 feet unless commercial production is found in the Ellenberger, above that point.

Important Wildcat Abandoned

The Maverick Oil Co. No. 1 Jim Rice, located in section 18, I.N.R. Survey, interesting wildcat in southeast Concho County, which previously showed for an oil producer last February when it logged sand from 1,830-42 feet and swabbed and flowed considerable oil, has been abandoned after shooting with 15 quarts of nitroglycerin at 1,828-47 feet, which brought out 7 to 10 bbls. of oil per day, with water, when bailed. This production was not sufficient to warrant trying to produce it. It was formerly drilled to a total depth of 2,454 feet in search of production in the Ellenberger, which proved barren, consequently was plugged back to 1,850 feet and shot before abandoning. Walter Nelson No. 1 Jim Rice, in section 30, Block 70, H.&T.C. Survey, about 1 mile northwest of the Maverick test, will be closely watched to see what it picks up around 1,825-50 feet. It is now drilling below 1,500 feet.

Another Wildcat Abandonment

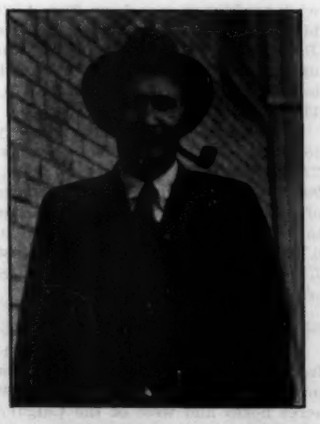
The extreme wildcat test of the Woodley Petroleum Co., located in section 30, Block 35, Township 1s, T.&P. Survey, 2½ miles southeast of Stanton in Martin County, has been abandoned at a total depth of 3,650 feet after striking water from 3,495 feet to 3,512 feet. It is located on the M. S. King ranch.

Ward County Extension

Richardson Oils, Inc., is extending the southern Ward County producing area farther to the south and west by its No. 1 Hathaway, located in section 37, Block 34, H.&T.C. Survey, 1½ miles southwest of another recent extension in this area. So far the well only appears as a gasser, but the gas has been killed and it is to be carried deeper to contact oil saturated sections. It blew out at 2,271 feet, making an estimated 15,000,000 feet of dry gas, the drill pipe sticking 20 feet off bottom.

Two Wildcats Abandoned in Jones County

Danciger Oil & Refining Co. and Pearson No. 1 T. J. White, southwest of the Sandy Ridge pool in eastern Jones County, has been abandoned after appearing as a King sand well last week. It logged high gravity oil from 2,268-69 feet in soft sand, but struck water from 2,269-71 feet, logging other oil showings at 2,275-88 feet. Total depth of the hole is 2,303 feet. It is located in section 6, Block 15, T.&P. Survey.



Earl Whitcomb, attorney and land man for the California Co. at Midland, Tex.

The other failure for Jones County was given up about 2 miles north of production in the Hawley pool. Fain and McGaha of Wichita Falls, ordered this hole plugged at a total depth of 2,335 feet. It logged only a slight showing of oil from 2,313-30 feet. Same is located on the Nettie Hayden farm in the north end of the Martinez Survey No. 195. Humphreys No. 1 Mrs. Ella C. Duke, in the same survey, but in the Hawley pool, is appearing as a dry hole also. It is drilling past 2,350 feet without striking commercial production and all sands except the King sand have been passed through. If that sand proves barren, the test will be plugged.

Outpost Test

Gulf Oil Corp. No. 6 Goldsmith, a south offset to Dunning's lone producer and discovery on the Scharbauer Ranch, 1 mile northwest of the Goldsmith field, Ector County, swabbed 117 bbls. of oil in 25 minutes and then flowed 65 bbls. of oil the next 35 minutes, at total depth of 4,196 feet. During the next 19½ hours it swabbed and flowed 202 bbls., the hole being carried deeper to increase the output. Total depth of the Dunning producer, located in section 33, Block 44, 1n, T.&P. Survey. The Gulf well is in section 4, same block and survey but in Township 1s. It will make the second well for this recently opened area which will eventually be connected to the Goldsmith field proper.

Ranger and North Texas

Andrews Howsley of Albany is to drill a wildcat test 7 miles northeast of the Lueders pool, in northwestern Shackelford County. This test is to be located in section 169, B.B.B.&C. Survey, and is to be drilled in quest of Bluff Creek production, believed to lie at a depth of 1,700 feet.

Deep Cooke County Test

Derrick has been erected on the D. R. England farm in the Rama Dye Survey, 8 miles east of Gainsville in Cooke County, for a 5,000-foot test. Location is on a block of some 4,500 acres held by Ungerman & Rips of Tulsa, and which was assembled by Robert Evans of Gainesville. Another test for this area has been reported, C. W. Whitehead and associates of Oklahoma scheduled to sink a 4,500-foot hole, according to field reports. It is to be located on a 4,500-acre block between Gainesville and Whitesboro, and along U. S. Highway 82, in the Spring Grove community.

Good rains in the North Central and West Central Texas districts have already stimulated activities in the two districts. The supply of drill-

ing water had run so low in some of the counties that many rigs were shut down, but the staking of 60 locations in the latter district this week, and the starting up of many shut down wells is attributed to a plentiful water supply furnished by the rains. This is the greatest number of locations reported for the North Central Texas district in a number of months.

Cooke Discovery

Petroleum Producers No. 1 J. W. Mount, located in the J. C. Meeks Survey, approximately 3 miles south of the Huggins pool and about 2 miles northwest of the Trew production, near Gainesville, opened another producing area for Cooke County this week when it logged a sand from 1,663-84 feet and showed for a good producer. An offset is already drilling near the pay found in this discovery and should be completed this week if it is to make a producer. Potential gauge on the discovery has not yet been reported. It was first drilled to 1,704 feet after producing some oil at 1,545 feet, but was later plugged back to 1,685 feet to set liner.

Young County Wildcat

The Yorktex Petroleum Co. has made location for a wildcat test southeast of the McLester production and about 6½ miles northwest of the old South Bend pool in Young County and is to sink a 4,000-foot test. Same falls on the F. G. Burnett lands in the G. W. Hill Survey, Abstract 151. About 3 miles east of Padgitt, in the northwest part of the county, Horwitz and Oldom are to drill a test on the S. B. Street lands in section 316, T.E.&L. Survey.

Production in the North Central Texas district crept up to some 65,600 bbls. per day this week. The oil in this district seems to be more in favor than it was during the past five years and the major purchasing units continuing to tie into new producers and into new pools as they are brought in.

Hamilton County

The Seaboard Oil Co.'s No. 1 Julia Dawson, located about 12 miles northwest of Hamilton in Hamilton County, and about 3,000 feet north of its discovery gasser in this area. Is drilling below 3,300 feet in lime after topping the Ellenberger at 2,990 feet. The top of the Ellenberger may be given a shot of acid in an effort to make an oil producer, but if that proves futile it will probably be plugged back to the 2,500-foot level to complete as a gasser.

Jack County

The Bryson pool of Jack County is one of the busiest pools in the district, six locations having been staked this week for that many new tests, and with a score of rigs running in the area where holes are punched down from 3,000 to 4,000 feet in quest of production in the sand and also lime pay horizons. A number of good wells have been completed in the treacherous sand area, with independent operators and small companies doing all the drilling. The Panhandle Refining Co. No. 1 G. P. Klingelsmith, in the southeast part of the Mary Hamilton Survey, about 3 miles east of the pool, logged a showing of oil in sand at 2,910-19 feet and casing was set and cemented. But so far the test has failed to come through as a producer and it is drilling around 3,200 feet, contract depth.

Panhandle

Production in the Panhandle district dropped nearly 9,400 bbls. per day, in the week ending May 7. Production was slightly over 56,750 bbls. per day, which figure was brought about by the readjustment of leases to fit the new schedule. Last week's higher figures were due in part to lease storage being cleaned up and moved.

There were 15 tests completed in the district this week, 2 of which proved dry holes, 1 in Hutchinson and the other in Wheeler County. A dozen locations were staked for new tests in the fields.

Purchase

The Skelly Oil Co. has purchased the Crawford Gasoline Corp.'s 10,000,000-foot casinghead gasoline plant in section 124, Block 4, Carson County, and is to operate same in the future. The plant was erected in 1930, being operated by the Crawford company since 1932.

WEST CENTRAL TEXAS COMPLETIONS

Callahan County

Campbell & Pennington No. 1 Jackson, dry and abandoned 1,800 feet. Fikes and others No. 1-H Jackson, total depth 1,007 feet, 107 bbls. Hughes No. 1 Williams, dry and abandoned 2,112 feet. Jacobs No. 1 Reid, dry and abandoned 1,396 feet. Kleiner and Warren No. 1 Jackson, total depth 1,262 feet, plugged back to 1,180 feet, 3,600,000 feet of gas. Lockhart No. 2 Wood, dry and abandoned 1,933 feet. Pueblo Petroleum Co. No. 3 Jackson, total depth 960 feet, 42 bbls.

Comanche County

Ellis No. 1 Adcock, temporarily abandoned 230 feet.

Eastland County

Hoff No. 1 Nabors, dry and abandoned 1,070 feet. Wisdom No. 1 Wende, total depth 3,503 feet. Plugged back to 3,280 feet, 12 bbls.

Shackelford County

Albany Oil Co. No. 8 Davis, 1,591 feet, 55 bbls. oil and 15 bbls. water. Baker and Pardue No. 3 Morris & Buie, 1,604 feet, 257 bbls. Charter Oil Co. No. 8 Mimms, 1,600 feet, 202 bbls. Condor Petroleum Co. No. 1 Davis, dry and abandoned 1,875 feet, No. 2 Reynolds, junked 1,910 feet. Eppenauer Petroleum Co. No. 3 Morris & Buie, 1,588 feet, 125 bbls. Gilman & McMurrey No. 14 Jeter, dry and abandoned 938 feet. Hart No. 1 Dodson, dry and abandoned 724 feet. Healey and Water No. 1 Newell, dry and abandoned 1,577 feet. Hoffman and Page No. 18 Morris & Buie, 1,607 feet, 20 bbls. Humble Oil & Refining Co. No. 2 Nail Estate, 1,545 feet, 3 bbls. oil and 8 bbls. water. Livingston & Wellman No. 2 Morris & Buie, 1,581 feet, 4 bbls. Loggie and Arndt No. 1 Ghio, 596 feet, 2 bbls.

Price No. 1 Dyer, dry and abandoned 1,280 feet. Reliance Oil & Royalty Co. and Skelly No. 1-D Matthews, dry and abandoned 3,160 feet. Reliance Oil & Royalty Co. and Jones & Stasney No. 1 Davis, 1,601 feet, 60 bbls. in 8 hours. Roeser & Pendleton Inc. No. 1 Nail, dry and abandoned 1,570 feet. Roeser & Pendleton and Humble Oil & Refining Co. No. 4 Morris & Buie, 1,607 feet, 130 bbls. Roeser & Pendleton Inc. and Merry Brothers & Perini No. 1 Lynch, dry and abandoned 4,515 feet. Simmons and others No. 2 Harvey, total depth 1,714 feet, plugged back to 1,655 feet, 20 bbls.

Terry and Pare No. 1 Green, dry and abandoned 1,110 feet. Turner and Ferguson No. 1 Dyer, dry and abandoned 1,278 feet. West Texas Oil & Production Co. No. 5 Morris & Buie, 1,607 feet, 109 bbls.; No. 6 Morris & Buie, 1,608 feet, 216 bbls. White and Duncan No. 2 Morris & Buie, 1,596 feet. 30 bbs. Wood and Hausley No. 1 Nail, dry and abandoned 1,610 feet.

Stephens County

Michael and others No. 3 Whitney, dry and abandoned 562 feet. Homestead Oil & Gas Co. No. 2 North Texas Farms, Inc., dry and abandoned, 1,808 feet.

Throckmorton County

Warren No. 2 Ledbetter, dry and abandoned 775 feet. Petroleum Producers Co. No. 1-K Portwood, dry and abandoned 1,475 feet. Snyder No. 1 Timmons, dry and abandoned 1,165 feet. Brissey No. 1 McKeichen, dry and abandoned 712 feet.

PANHANDLE COMPLETIONS

Completions in the Texas Panhandle fields, with their top of sand and total depth records and initial production were as follows:

Gray County

Adams and Prince No. 5 Morse Cantone, 2,553-2,665 feet, plugged back to 2,625 feet, 497 bbls. pumping, shot with 500 quarts. Cambaian Oil Co. No. 5 Barrett, 3,194-3,283 feet, 565 bbls. pumping; shot with 630 quarts. Empire Gas & Fuel Co. No. 6 Cunningham, 3,210-3,301 feet, 467 bbls. pumping; shot with 480 quarts. Magnolia Petroleum Co. No. 13 Harrah, 3,112-3,195 feet, 522 bbls. pumping. Skelly Oil Co. No. 1 L. Holmes, 3,165 feet, dry and abandoned. Southern Petroleum Exploration Co. No. 4 Vaughn, 3,125-3,235 feet, 514 bbls. pumping; shot with 270 quarts. Texoma Natural Gas Co. No. 1-E F. A. Vaniman, 2,365-2,670 feet, 23,729,000 feet of gas.

Hutchinson County

Howard Bean and others No. 1 W. S. Christian, 3,285 feet, dry and abandoned. Phillips Petroleum Co. No. 1 J. A. Whittenberg, 2,845-2,888 feet, 369 bbls. of oil and 70 bbls. of water pumping; shot with 500 quarts.

Moore County

Magnolia Petroleum Co. No. 1 C. A. Herndon, 2,770-3,087 feet, 12,400,000 feet of gas. Magnolia Petroleum Co. No. 1 Mary Miller, 3,050-3,360 feet, plugged back to 3,330 feet, 4,789,000 feet of gas.

Wheeler County

Cub Oil Co. No. 2 Massey, 2,095-2,152 feet, 30,000,000 feet of gas. Fain-McGaha Oil Corp. No. 6 Binkley, 2,480-2,519 feet, 223 bbls. oil and 4,000,000 feet of gas flowing. Hanlon and Buchanan No. 1 G. Woodward, 1,923-2,240 feet, 22,050,000 feet of gas. Palmer and others No. 1 Sparlin, 2,100 feet, dry and abandoned.

Canadian Fields

Completions and Operations in Northwest and in Ontario

By VICTOR LAURISTON

CHATHAM, Ontario, May 9.—Official figures just issued show that crude petroleum production from all Canadian fields in January amounted to 121,231 bbls. compared with 125,658 bbls. in December and 124,654 bbls. in January, 1935. New Brunswick production was down from 1,026 bbls. in December to 1,013 bbls. in January and Ontario production was up from 14,514 to 15,047 bbls. Alberta production dropped from 110,118 to 105,171 bbls.

Natural gas production in January totaled 3,499,002,000 feet against 2,982,607,000 in December and 3,561,990,000 feet in January, 1935. Imports of mixed (natural and artificial) gas into Canada in January amounted to 6,709,000 feet valued at $4,041 against 7,144,000 feet valued at $4,812 in December.

Spy Hill Oil Prospect

Del Monica Oil Co. recently organized at Calgary has taken out a prospecting permit covering 10,000 acres north and west of the Calgary city limits, in the Simon's Valley and Spy Hill areas. From geological investigation already secured, a deep test will be started this spring, probably on the Gray farm, where shallow gas production was encountered in a limestone formation several years ago. Imperial Oil, Ltd., is reported to have leased the Mrs. Peter Pallesen farm on Spy Hill.

South Turner Valley

In section 21-18-2w5, South Turner Valley, Union-Freehold Oil Corp. No. 1, LSD 8, has stopped drilling 850 feet in the Madison limestone at 6,460 feet, and is testing production. A previous test 200 feet higher showed around 2,500,000 feet a day of wet gas, with up to 35 bbls. a day naphtha recovery. Farther south in the same section, Highwood-Sarcee Oils No. 2, LSD 1, is below 4,330 feet and getting close to the Home sands. In the north end of the section, Sovereign Royalties No. 1 Myers & Wright, LSD 14, is resuming after running 12½-inch casing to bottom at 2,200 feet.

In section 28-18-2w5, Turner Valley Royalties' No. 1, LSD 13, is in the Dalhousie sand below 6,120 feet. Sterling-Pacific No. 3, LSD 13, section 33-18-2w5, is spudding.

South of the proven field, Century

(Continued on Page 275)

East and East Central Texas

By L. E. BREDBERG

HUMBLE EXTENDS TALCO ONE MILE EAST; WILDCAT FAILURES

DALLAS, Tex., May 11.—The Talco field in northeast Titus County was extended 1 mile east this week when Humble Oil & Refining Co. No. 1 Galt in the R. Winn Survey flowed 340 bbls. in 14 hours through 2½-inch open tubing, total depth 4,349 feet. A number of locations have been staked in the area, the majority of them in the Townsite, the Lucey Petroleum Corp. of Dallas, alone, obtaining permits for 12 tests in this immediate area.

The No. 1 Galt is about 1 mile east of the discovery well and the company's No. 1 Groves is about 2 miles east of the discovery, one test drilled on the Groves land to 4,492 feet having been temporarily abandoned at that depth, but 8-inch casing having been recently set preparatory to carrying it down in quest of production in the Glen Rose, lower member of the Trinity sand.

No. 2 Groves, topped the Paluxy at 4,183 feet and logged oil sand at 4,196 feet. Seven-inch casing was set at 4,180 feet, with total depth of the hole standing at 4,255 feet. It will also be tested this week, and both tests will be closely watched for developments.

Joiner No. 1 Huernish heirs, located about 12 miles east of the Talco discovery, and in wildcat territory, is shut down at contract depth of 4,500 feet without showing any oil or gas. Base of the Woodbine was logged at 4,015 feet, with no Georgetown having been reported.

Jule Alford, who recently abandoned one test on the Fry farm in the I. P. Stern Survey, about 2½ miles south of the Talco discovery, has made location and has derrick up for a second test on this farm. Location is 1,313 feet north of No. 1 Fry. The Nemo Oil Co. has derrick up on the Talco School lot in the I. P. Stern Survey and the Ownby Drilling Co. and others have derrick up on the F. Jones lands in the center of Lot 6, Block 16, M. V. Delgado Survey, a townsite test. Clyde H. Cox of Longview has a location on the S. Warner lands in Block 13, Delgado Survey, in the townsite, and W. E. McClintock of Mount Pleasant has permit to drill a test on the J. F. Barton lands, in the same survey. Another test is to be drilled in the Talco townsite by Roosth and Genecov Production Co. of Tyler, in Lot 11, Block 12, Titus County, and a test is to be started on the W. E. Franklin farm, in the J. M. Nugent Survey, same county. Walter Keith and A. B. Turner of Mount Pleasant, are to drill on the Guy Franks lot in Lot 14, Block 16, Talco townsite, and another is to be started by W. H. Baker of Tyler, on the C. E. Jones lot in Lot 1, Block 21, in the townsite. If all of these tests get under way at once the townsite will be one of the busiest areas in the state.

Humble Oil & Refining Co. No. 1 Galt, in the R. Winn Survey, 1 mile to the east of the discovery, and the same company's No. 2 Groves, in the Ben Jones Survey, have both logged thick sections of saturated Paluxy sand, penetrating it much farther than the discovery well of the Pleasant Oil Co., and as a result of such penetration without the slightest trace of water showing, the latter company has moved in a machine to deepen its pumping well, the discovery on the Carr lands, in the Delgado Survey. Total depth of that hole is 4,208 feet.

More Dry Holes

Four dry wildcats were reported in the East Central district this week, and another test abandoned at 31 feet. The deepest abandonment was in Nacogdoches County where the Overtex Oil & Gas Co. ordered its No. 1 Hazelwood plugged at 5,679 feet, in Georgetown lime. It is located in the J. L. Ewing Survey, 15 miles west of Nacogdoches. Elevation is 259 feet. The next deepest test was given up as dry in Cherokee County, at a total depth of 4,875 feet. Peveto and others drilled this "duster" on the C. R. Kelly lands, in the Jose Pineda Survey, 3 miles north of Jacksonville. Elevation is 565 feet. Sand was logged at 4,820 feet. Rowley and others abandoned their No. 1 Dean in Limestone County at 1,845 feet. It is located 3½ miles southwest of Mexia.

Kelso and Thompson (Winona Oil Corp.) abandoned No. 1 McClung, in the E. Newberry Survey, 1 mile east of Winona in northwest Smith County, at a total depth of 3,780 feet. Elevation is 449 feet. It has been standing shut down for some time.

E. H. Dougherty is to deepen an old test 4 miles west of Groesbeck in Limestone County, and is now rigging up over the old hole which is bottomed at 3,131 feet. It is located on the S. Welch lands, in the A. Varela Survey.

Another Trinity Sand Test

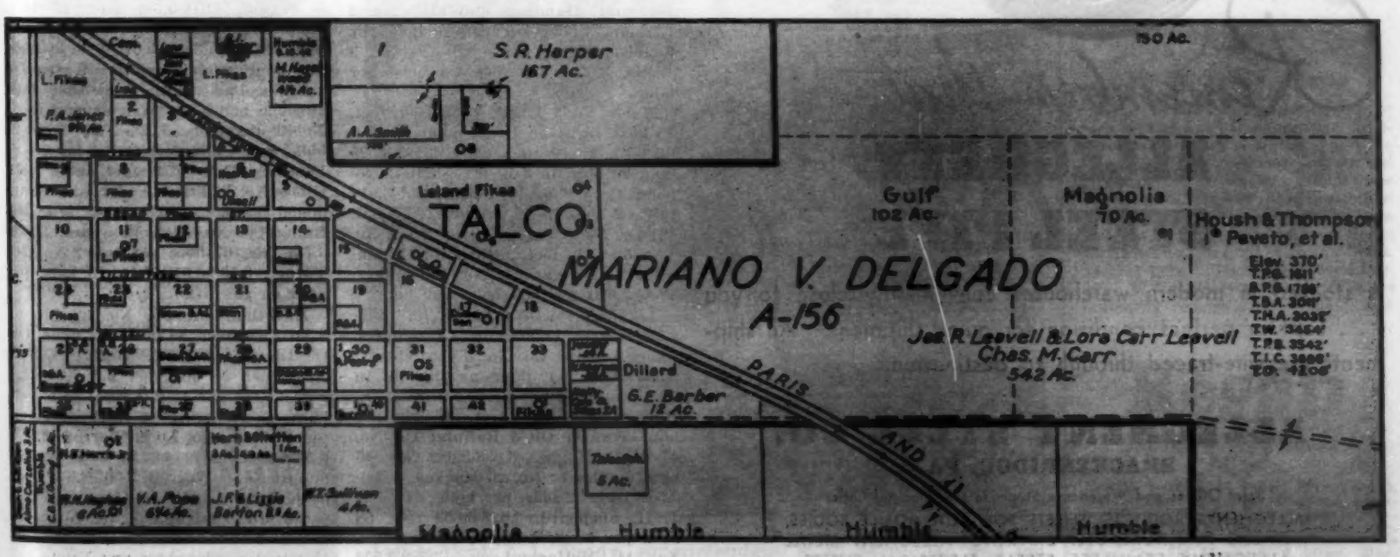
The Tide Water Oil Co. and Seaboard Oil Co., first companies to bring in a Trinity sand producer in the East Central Texas district, are moving in machinery used in drilling their first Trinity sand producer in the Cayuga field, northwest Anderson County, and the first in the district, to drill a second deep test in that field. Same is to be known as No. 15 Edens, and location is 3,700 feet from the east and 1,917 feet from the north line of the J. N. Edens 988.6-acre farm in the Samuel Snider Survey. The first Trinity sand producer in the pool was carried to 9,085 feet, but was plugged back after striking water and completed at 7,416 feet in the lower Glenrose, lower member of the Trinity, which it logged at 7,205-7,990 feet, with an elevation of 308 feet. It first produced only gas and distillate, but after being on production several weeks started making high gravity oil. Other wells in the Cayuga field are producing from the Woodbine sand, but the joint owners of most of the acreage in the field are no doubt exploring the deeper pay formation to obtain further information on the potentialities of that section.

Bowie Wildcat

The Westmount Oil Co. of Dallas (M. J. Delaney and associates) is to drill a 4,000-foot Paluxy sand test on a block of some 13,000 acres in the northwestern part of Bowie County. Location is in the center of the Phillips 115-acre tract in the C. W. Hancock Survey, and derrick is already up for the test. Heath M. Robinson, Dallas geologist, and some Tulsa parties are interested in this wildcat.

East Texas Field

The northwest edge of the East Texas field, to the northeast of Gladewater, in Upshur County, was extended about another mile to the northwest this week when Cone's No. 1 Williams, located in the Justamente Survey, proved a producer. The well is located approximately 2½ miles northwest of the heavier producing edge of the field, but there are wells



Numerous townlot locations have been made in Talco, Titus County, Texas, since completion of Housh, Thompson and others discovery

within a mile of the new extension, which will prove still more acreage for the field and call for more drilling in its vicinity.

Locations and Completions

There were 77 locations staked in the East Texas field this week with 55 tests being completed, two of which were dry holes, one in Rusk and one in Upshur County. Nine pumpers and three swabbers were completed, and one test was completed on gas lift.

Removing Tanks

The Chicago Bridge & Iron Works, under direction of D. D. Williams, superintendent, has the contract for removal of five 80,000-bbl. steel tanks from the abandoned Texas Co. tank farm at Springfield, 6 miles south of Mexia. The tanks are to be cut down and moved to Houston.

Transfer of Producing Properties

Recently the American Liberty Oil Co. has purchased the Southport Petroleum Co.'s Barton, Elder and Kilgore School leases, in the Van Winkler Survey, Gregg County, including seven wells.

The Indiana Oil Co. has acquired the Hale lease in the Pena Survey, Rusk County, including three wells, from the Chester Oil Co. The Muckleroy well, located in the Van Winkler Survey, Gregg County, formerly operated by McVey and Aldahl is being operated by Mary E. Stephens.

EAST CENTRAL AND EAST TEXAS COMPLETIONS

Completions in the East Texas field and in East Central Texas during the week with their top of sand and total depth records and initial production were as follows:

Miscellaneous Completions

Anderson County

Roeser & Pendleton, Inc., No. 2-B Billett, total depth 4,032 feet, 95 bbls. in 24 hours through one-eighth inch choke; No. 4 Ware & Wilson, total depth 4,033 feet, 33 bbls. in 24 hours through one-eighth inch choke on gas lift. Tide Water and Seaboard Oil Co. No. 2 Lutterloh, total depth 4,048 feet, plugged back to 4,019 feet. Shot with 24 quarts, 4,012-16 feet, 134 bbls. in 24 hours through one-eighth inch choke.

Cherokee County

Peveto and others No. 1 Kelly, dry and abandoned 4,875 feet, Pecan gap 3,553-3,980 feet, Austin 4,575-4,745 feet, sand 4,820 feet, elevation 565 feet, 3 miles north of Jacksonville.

Droppleman No. 5 A. Kelly, 3,710-3,711 feet, 18 bbls. in 30 minutes. Texas-Canadian No. 4 F. A. Keel, 3,644-3,663 feet, 60 bbls. in 45 minutes; No. 6 F. A. Keel, 3,692-3,693 feet, 25 bbls. in 30 minutes; No. 3-A A. Kelley, 3,676-3,677 feet, 20 bbls. in 20 minutes.

Freestone County

Yancey and others No. 1 Scott, dry and abandoned 31 feet.

Henderson County

Worsham No. 1 Wathen, total depth 4,092 feet, 127 bbls. in 24 hours through one-eighth inch choke.

Limestone County

Rowley and others No. 1 Dean, dry and abandoned, 1,845 feet, 3½ miles southwest of Mexia.

Nacogdoches County

Overtex Oil & Gas Co. No. 1 Hazelwood, dry and abandoned 5,679 feet, elevation 259 feet, 15 miles west of Nacogdoches.

Smith County

Kelso & Thompson No. 1 McClung, dry and abandoned 3,780 feet, elevation 449 feet, 1 mile east of Winona.

EAST TEXAS FIELD

Gregg County

Arkansas Fuel Oil Co. No. 33 Burnside, 3,483-3,509 feet, 27 bbls. in 15 minutes; No. 8-A Castleberry, 3,640-3,649 feet, 17 bbls. in 15 minutes; No. 16-A McKinley, 3,585-3,610 feet, 22 bbls. in 15 minutes. Selby Oil & Gas Co. No. 29-B Snavely Heirs, 3,574-3,586 feet, 49 bbls. in 30 minutes; 34-B Snavely Heirs, 3,560-3,574 feet, 60 bbls. per hour.

Stanolind Oil & Gas Co. No. 40-B McKinley, 3,610-3,665 feet, 15 bbls. in 15 minutes. Tide Water and Stanolind No. 11 Tuttle, 3,494-3,526 feet, 12 bbls. in 10 minutes. Gralenor Oil Co. No. 12 King, 3,697-3,698 feet, 60 bbls. per hour. Gulf Oil Corp. No. 4 Clayborn, 3,645-3,657 feet, 70 bbls. per hour. Hamilton and Ellis No. 2 Utzman, 3,445-3,485 feet, 20 bbls. per hour on pump. Kinso Oil Co. No. 3 Wells, 3,651-3,652 feet, 20 bbls. per hour.

Rubin No. 1 Laird, 3,482-3,505 feet, 35 bbls. in 24 hours on pump. Schulman No. 1 City of Kilgore, 3,485-3,525 feet, 20 bbls. in 3 hours. Shell Petroleum Corp. No. 10 King, 3,607-3,614 feet, 32 bbls. in 30 minutes. T. W. M. Oil Co. No. 3 Sabine River Tract No. 1, 3,566-3,570 feet, 20 bbls. in 15 minutes. The Texas Co. No. 17 Walker, 3,588-3,590 feet, 60 bbls. per hour.

Arkansas Fuel No. 14 Calvin, 3,557-3,582 feet, 31 bbls. in 15 minutes. Camp Drilling Co. No. 5 Castleberry, 3,550-3,600 feet, pumping 20 bbls. in 24 hours. Gulf Oil Corp. No. 10 M. F. Barker, 3,534-3,590 feet, 50 bbls. per hour. Humble Oil & Refining Co. No. 41 W. R. Hughes, 3,658-3,682 feet, 45 bbls. per hour; No. 26 Mackey, 3,566-3,581 feet, 32 bbls. per hour; No. 9-A J. H. Sheppard, 3,626-3,652 feet, 58 bbls. per hour. Lucey Petroleum Co. No. 11 McHaney-Loeb, 3,529-3,554 feet, 15 bbls. in 15 minutes. Powell & Irion (formerly Producers Petroleum Corp. No. 2 Jeeter) No. 2 Smith-Moody, 3,617-3,618 feet, 100 bbls. in three hours.

T. Schroeder No. 4 E. Church, 3,595-3,636 feet, 40 bbls. per hour. Stanolind Oil & Gas No. 10-A S. G. and Maude Smith, 3,518-3,557 feet, 15 bbls. in 15 minutes; No. 6 J. F. White, 3,623-3,696 feet, 14 bbls. in 15 minutes. Stanolind and Tide Water No. 11 F. M. Fonville, 3,529-3,650 feet, 23 bbls. in 30 minutes; No. 22 J. C. Person, 3,502-3,560 feet, 24 bbls. in 20 minutes. J. G. Beard No. 11 J. S. and Frank Elder, 3,485-3,497 feet, swabbing 8 bbls. per hour. Gralenor Oil Co. No. 11 A. A. King, 3,671-3,672 feet, 20 bbls. in 30 minutes.

Humble Oil & Refining No. B-83 S. S. Laird, 3,570-3,632 feet, 60 bbls. per hour. Lee & Williams No. B-1 J. R. Carter, 3,590-3,592 feet, 8 bbls. in 15 minutes. M. M. McVey No. 7 Richards, 3,457-3,465 feet, 23 bbls. per hour air lift. J. C. Potter No. 4 G. W. Culver, 3,531-3,555 feet, pumping 20 bbls. per day. Rajo Oil Co. No. 12 Mrs. A. C. McComic, 3,731-3,732 feet, 15 bbls. per hour. R. F. Rutledge No. 2 Sam Carr, 3,497-3,513 feet, 20 bbls. in 13 minutes. Shell Petroleum Corp. No. 11 J. S. King, 3,625-3,638 feet, 35 bbls. in 30 minutes. Sun Oil Co. No. 20 A. G. Morton, 3,440-3,461 feet, dry and abandoned; No. 21 A. G. Morton, total depth 3,503 feet, dry and abandoned.

Rusk County

Stewart Oil Co. No. 1 Ferguson, 3,495-3,512 feet, 7 bbls. per hour on pump. Groneman and others No. 6 Mayfield, 3,604-3,630 feet, 5 bbls. per hour, swabbing. Humble Oil & Refining Co. No. 170 Crim, 3,693-3,703 feet, 50 bbls. per hour; No. 172 Crim, 3,657-3,715 feet, 60 bbls. per hour; No. 73-B Laird, 3,541-3,626 feet, 40 bbls. per hour. No. 89-B Laird, 3,575-3,634 feet, 75 bbls. per hour; No. 2-B Sexton, 3,610-3,660 feet, 10 bbls. per hour on pump.

Hurtle Oil Co. No. 13-B Sexton, 3,565-3,606 feet, 8 bbls. per hour; No. 14-B Sexton, 3,568-3,606 feet, 8 bbls. per hour; No. 16-B Sexton, 3,578-3,632 feet, 12 bbls. per hour; No. 17-B Sexton, 3,581-3,632 feet, 10 bbls. per hour; No. 19-B Sexton, 3,541-3,595 feet, 15 bbls. per hour.

McCutchin No. 5 Beall, 3,710-3,722 feet, 20 bbls. per hour on pump; No. 2 Kennedy, 3,599-3,601 feet, 20 bbls. per hour. Rudco Oil & Gas Co. No. 3 Sexton, 3,616-3,648 feet, 25 bbls. per hour. Sinclair Prairie Oil Co. No. 1-D Kennedy, 3,604-3,615 feet, 20 bbls. per hour swabbing. Tide Water Oil Co. No. 18-A Bean, 3,581-3,635 feet, 40 bbls. per hour. Weaver and Crim No. 3 Peterson, 3,626-3,627 feet, 20 bbls. in 20 minutes. Callender No. 1 Watson, 3,656-3,670 feet, gas well. Gibbs No. 1 Trimble, dry and abandoned 3,759 feet. Humble Oil & Refining Co. No. 44-A Plowman, 3,675-3,737 feet, 67 bbls. per hour; No. 2-B Turner, 3,538-3,578 feet, 10 bbls. per hour on gas lift.

Marathon Oil Co. No. 32 Moore, 3,597-3,646 feet, 48 bbls. per hour. Ortiz Oil Co. No. 8-A Tolliver, 3,660-3,747 feet, 50 bbls. per hour. Mathis No. 1 Wallace, 3,578-3,648 feet, 30 bbls. in 12 hours on pump. Overton Refining Co. No. 2 Worrell, 3,574-3,597 feet, 25 bbls. in 3 hours on pump; No. 6 Worrell, 3,563-3,572 feet, 30 bbls. in 2 hours on pump.

Sinclair Prairie Oil Co. No. 15-B Mayfield, 3,611-3,619 feet, 21 bbls. in 15 minutes. Slaughter and Kugle No.

(Continued on Page 291)

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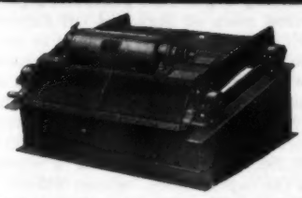

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Among Gulf Coast Drilling Contractors

The latest Gulf Coast contracting company to be formed and which has now four rigs in operation, is the Wynn Crosby Drilling Co., headed by A. W. Crosby, former vice president of the Navarro Oil Co. At the Seven Sisters field in Duval County, No. 3 Welder is being completed for the Navarro Oil Co. No. 1 Serna, a wildcat in Duval County for the Santa Clara Oil Co. is drilling below 1,500 feet while at the Sam Fordyce field No. 3 Guerra is being rigged up for the Navarro Oil Co. The fourth rig is located at Boling on a workover job for S. A. Brewster and others.

Glenn H. McCarthy completed No. 9 White at the Anahuac field for Humble Oil & Refining Co. and is rigging up No. 10 White. In the Amelia field a rig is being moved in for No. 1 Langham while in Chambers County his No. 1 Pitt is drilling below 6,500 feet.

Edwards Drilling Co. has three rigs running, located as folows: One at the Grigsby Prospect in Hardin County for David B. McDaniel, one at the Cow Bayou field in Orange County for the Texas Canadian Oil Co. and one at the Dickinson field for the Kenben Oil Co.

Nicklos Drilling Co. completed No. 1 Sonnier at the Tepetate field in Acadia Parish for the Continental Oil Co. and is moving the rig to drill No. 3 Homeseekers. No. 2 Welch has been spudded and at the Port Barre field for the Pan American Producing Co. No. 2 Cormier is drilling below 200 feet.

C. & C. Drilling Co. is preparing to plug back No. 2 Lawrence from a depth below 7,000 feet to around 6,600 feet where it will be tested a second time. It is being drilled for the Salt Dome Oil Co. and is located on the Cotton Lake Prospect in Chambers County. A 1,200-foot northwest extension was marked up for Dick Schwab and C. & C. Drilling Co. at the South Houston field. The well flowed 410 bbls. of oil per day. This rig will be moved to Polk County for Dick Schwab and others No. 1-A Kirby Lumber Co.

Rutherford Drilling Co. has bottomed No. 1 Langham in oil sand at 7,505 feet at the Van Vleck field for the Skelly Oil Co. and is preparing to complete. The rig will be moved in for No. 7-B Cobb which is a new contract. In the meantime for the same company, No. 6-B Cobb is drilling below 5,765 feet and No. 1 Rugelsey is drilling in sandy shale below 5,359 feet. A fourth rig is located at the Sam Fordyce field for the same company.

Contract has been let to Noble Drilling Co. for a deep test to be drilled in Jefferson Davis Parish for Strake Oil Corp. In the meantime Stanolind Oil & Gas Co. No. 1 State at Turtle Bay has been completed for an initial production of 155 bbls. per day and the rig will be moved to a new location. Two other rigs are active in this field for Stanolind.

Smith and McDannald have moved in a rig to the Lakeview area in Wharton County for No. 1 Priesmeyer located a half mile northwest of their No. 1 Mitchell which was completed for a gas well last week. It will be drilled to the 5,500-foot sand which produces at the Pickett Ridge field and if no shows are encountered it will be drilled deeper. At the Long Lake field, contract was received

(Continued on Page 268)

Left to right: B. L. Bundy, superintendent; H. C. McMullen and Joe Meagher, Texas Co., Lafitte field, Jefferson Parish, Coastal Louisiana

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Michigan Field Report

ENCOURAGING SHOWINGS IN WILDCATS IN TWO COUNTIES

By PAUL A. ELLIOTT

MUSKEGON, Mich., May 11.—Two wildcat showings of oil in the upper Traverse, one in Rolland Township, Isabella County, and the other in Sumner Township, Gratiot County, encouraged central Michigan operators to lay immediate plans to deepen to the Dundee although they failed to develop commercial flow in the upper stratum.

George Hanners No. 1 Dargitz, section 20, Rolland Township, had been drilled to 3,080 feet after striking a show at 3,031 feet. McPherson Oil Co. No. 1 Sharrar, section 11, Sumner Township, had reached a depth of 2,855 feet. It will be plugged back and acid treated if commercial production cannot be found in the Dundee.

Shows in both of these tests already had aroused new interest in the areas. Pure Oil Co. was drilling in the Traverse in the No. 1 Comstock, section 15, Rolland Township.

Two other Sumner tests were scheduled to be carried to the Dundee as the result of the McPherson-Sharrar oil showings. They are C. W. Collins No. 1 Tomlin, section 27, shut down for several weeks at 1,100 feet, and John Pentowski No. 1 Sharrar, section 23, shut down at 1,000 feet for several months. Gulf Refining Co. also was reported planning a new Gratiot County test, No. 1 Redman, section 1, Wheeler Township.

In Isabella County H. O. Butler No. 1 Seiter, section 6, Isabella Township, will be abandoned after failure to develop commercial gas flow in the Michigan Stray sands.

Midland County

Pure Oil Co. brought in the largest oil producer of a comparatively quiet week, its No. 7 Bond-Root, section 3, Jasper Township, which was rated good for 1,000 bbls. a day in the Traverse. Same operators were nearing Dundee in the Bond-Root No. 6, section 3, Jasper Township.

King Drilling Co. prepared to treat with acid a showing found the previous week in the Dundee in No. 1 George Gould, section 19, Denver Township, newly listed producing field.

Three other Midland County tests, Jetter Oil Co. No. 1 French, section 2, Porter Township; Ward J. Blunt No. 1 Harrison, section 18, Greendale, and Flyn and Larsen No. 1 Green, section 13, Jasper, also were nearing completion in the Dundee as semi-wildcats or extensioners.

J. V. Wicklund struck water in the Dundee in the No. 1 Rohrer, wildcat test in section 7, Edenville Township. Drilling was continued.

Bay County

Successful production of T. F. Caldwell, Inc., No. 1 Charles W. Kraus, section 12, Gibson Township, Bay County, which was making 25 to 50 bbls. a day from the Traverse limestone, is expected to result in considerable drilling activity in this field this year.

M. C. Fordyce No. 1 Suszko, the discovery test in the area, has been producing about 15 to 20 bbls. for several weeks. The new well is an east offset.

The Caldwell company holds leases on about 2,500 acres surrounding the two wells and is planning considerable development soon.

Vickeryville

Completion of Star Petroleum Co. No. 1 Ward, section 20, Bloomer Township, Montcalm County, was delayed last week by casing trouble, postponing decision as to future prospects of extending the Vickeryville field 2 miles east and 2 miles south of the Jetter Oil Co. No. 1 Long. Water broke in the new test.

Rowmor Corp. No. 1 Tow, section 36, Evergreen Township, was deepest of several other tests in the area, drilling at more than 2,800 feet. Jetter Oil Co. No. 1 McCracken, section 6, Bloomer Township, was drilling at more than 2,000 feet.

Jetter Oil Co. also was preparing to test the Dundee in the Pitcher wildcat, section 5, Crystal Township.

About four other tests were drilling in the Vickerville area.

Beaverton

Triangle Oil Co. No. 1 Iosco Land Co., section 2, Beaverton Township, Gladwin County, extended the north central Michigan field two locations east with its flow of 150 bbls. during the first five days after striking Dundee oil at 3,892 feet.

Three Grout Township tests held the attention of operators last week, one nearing the Dundee, namely: Mammoth Petroleum & Refining Co. No. 1 Mellinger. It was more than 3,700 feet deep in section 35. Charles Bell No. 1 Ross, section 34, also was more than 3,100 feet deep, while the third test, T. F. Caldwell, Inc., No. 1 Parker, section 21, was at a lesser depth than 1,300 feet.

Smith Petroleum Co. No. 2 Fruchey, section 3, Beaverton Township, was nearing the Dundee at 3,400 feet in proven territory.

Crystal—Montcalm

The Rowmor Corp. struck a flow of 26,000,000 feet of gas in the No. 1 Honderich, section 1, Crystal Township, Montcalm County, in a test drilled as an offset to a 200-bbl. Dundee oil well.

Although started as an oil test, it will be completed for gas, the rig skidded and another hole drilled to the oil sands, operators announced. It made the heaviest flow of any test in the Crystal area.

A gas flow of about 10,000,000 feet daily struck two weeks ago by the McClanahan Oil Co. in the upper Marshall sand in the Lincoln National Life Insurance Co. No. 1 test in section 29, Richland Township, Montcalm County, has been cemented off to carry the hole to lower oil sands. It is nevertheless considered the discovery well of a new central Michigan gas area.

Four tests in the Crystal and Ferris Township sections of the Crystal field were nearing Dundee completion as follows: Stork Oil Co. No. 7 Dickinson, section 3, Crystal Township: McClanahan No. 2 Lamphier, section 2, Crystal; J. W. Leonard, Jr., and others No. 5 West, section 5, and Daily Crude Oil Co. No. 3 Flint, section 34, Ferris.

Gassers

Rex Oil & Gas Co. completed the first gasser in section 6, Belvidere Township, Montcalm County, last week, striking a flow of about 28,000,000 feet a day in the No. 1 Bank of Detroit well, a half mile west and half mile south extension of the proved area.

Hyatt and Norton completed their No. 1 Dawes, section 4, Belvidere, for a flow of 36,000,000 feet, while W. J. Bernier No. 1 Bale estate, section 31, Millbrook Township, added another 12,000,000 feet to the Tri-Townships field potential. All were in the Michigan Stray sands.

The No. 1 Morgan, section 9, Winfield Township, Montcalm County, was being completed in the Michigan Stray sand by Stewart and Atha. Columbia Oil & Gas Co. also deepened its No. 1 Dutmers, discovery well in the Hinton Township section of Tri-Townships field, boosting it from 5,500,000 to 15,000,000 feet daily.

Four other tests were nearing the gas sands as follows: Superior Oil Co. No. 1 Smalley, section 2, Belvidere Township; Charles Bell No. 2 Bailey, section 30, Millbrook Township; Refiners Petroleum Co. No. 1 Garner, section 33, Millbrook and Hyatt and Norton No. 1 Fouts, section 3, Belvidere.

G. M. Obenauer No. 1 Berwald, section 26, Hinton Township, as Dundee oil test, also was nearing completion in the lower formation.

New Locations

Nineteen new locations for which state conservation permits were issued included mostly tests in proved areas in five central Michigan counties but several extension and wildcat tests.

Two of five new locations in Gladwin County were for wildcats, one in section 25, Buckeye Township, to be drilled by Goll, Graves & Mechling, Inc., on the B. Oard lease and the other for the same operators on a state lease in section 15, Sheridan Township.

One of eight new Montcalm County tests will add one to several recent Evergreen Township tests in the Vickeryville area. It is the Morris Oil & Gas Co. No. 1 Frank W. Young, section 36. Another wildcat will be Durham & Jones No. 1 Delos A. Towle, section 15, Pine Township.

Dry Holes

Three "dusters" were recorded last week, Mid-State Development Co. No. 1 Burleson, section 21, Taymouth Township, Saginaw County, dry in the Dundee, and Stork Oil Co. No. 1 Bross, section 29, Greenbush Township, Clinton County, also a failure in the Dundee.

Rex Oil & Gas Co. also struck bottom water in the No. 1 Johnson, section 32, Tyrone Township, Kent County, a west Michigan test. It was drilled into the Dundee. Michigan Oil Exploration Co. also was ready to test the Dundee in the No. 1 Croff, section 35, Vergennes Township, Kent County, near Lowell.

Jersey Financing

NEW YORK, May 11.—Standard Oil Co. (New Jersey) announced it was filing with the Securities and Exchange Commission application covering an issue of $85,000,000 25-year 3 per cent debentures to provide funds for retirement of the outstanding 5 per cent guaranteed preferred stock of Standard Oil Export Co., subsidiary. It is proposed to call the export company's preferred stock for redemption on July 30 at $110 a share. This will require $84,142,850.

Net earnings of New Jersey for the calendar year 1935 amounted to $62,863,192, equivalent to $2.42 a share on the capital stock, against $45,618,960, or $1.76 a share, in 1934.

Imperial Oil Directors

SARNIA, Ontario, May 9.—Shareholders of Imperial Oil, Ltd., at their annual meeting here recently re-elected the following officers and directors: President, G. Harrison Smith, vice presidents, R. V. Le Sueur, C. A. Eames, Leo McCloskey and John McNeil; director, A. E. Halverson.

Belgian Company in Texas

HOUSTON, Tex., May 11.—Petrograde, Inc., a subsidiary of the Petrofina Corp., one of the largest oil companies in Belgium, has filed application for a permit to do business in Texas under its Delaware charter. C. Bonnami, vice president and treasurer, will be in charge of operations in this state, with headquarters in Houston.

Texas and Louisiana Gulf

TESTS IN MONTGOMERY AND CALHOUN SHOW PRODUCTION

By F. L. SINGLETON

HOUSTON, Tex., May 11.—Favorable showings encountered in two wildcat tests in Calhoun and Montgomery Counties, Tex., together with the announcement of several interesting locations were the featured developments along the Gulf Coast the past week.

Humble Oil & Refining Co. No. 2 P. H. Welder located on the Green Lake Prospect, northern Calhoun County, made a 15-minute drill stem test from 5,458-74 feet, the total depth which showed 360 feet of 34 gravity oil, 125 pounds of pressure and 180 feet of water and casing has been cemented on bottom preparatory to testing through perforated casing. The top of the sand which is thought to be the Frio was topped at 5,450 feet. A previous test made from 5,458-66 feet showed 210 feet of oil and mud and 400 pounds of pressure.

The prospect is situated near the towns of Heyser and Bloomington in the Maria Rios Survey and No. 2 Welder is the third test drilled in the area. Several showings of oil and gas encountered in the first two tests led the company to drill the present well.

Much interest was being centered on the Willis area, northern Montgomery County, due to the showing made by Mid-Texas Oil Co. No. 1 Security Trust which tested 210 pounds of pressure on a 15-minute drill stem test from 4,250-4,300 feet. The test was made in the top of the Cockfield topped at 4,248 feet and the operators are coring ahead in salt water sand below 4,320 feet. The test was made 72 feet below the top of the Cockfield and the Conroe section is expected to be encountered around 4,500 feet. This is the second well to encounter favorable showings in he Cockfield in this area and whether it makes a commercial well or not, it is expected to lead to further exploration. The well is situated in the G. W. Loonin Survey east of the Willis Townsite and about 5 miles southeast of Gholson and others No. 1 Parks which last year showed oil and gas in the Cockfield sand bottomed at 3,969 feet.

Amelia's Second Oil Well

Humble Oil & Refining Co. No. 1 Guinn, approximately 1,100 feet south of the company's No. 1 Langham, the discovery well of the Amelia field, northern Jefferson County, was brought in at the close of the week from a screen setting at 6,760-76 feet, the total depth, and flowed 32 bbls. per hour through a quarter-inch choke with tubing pressure 850 pounds and casing pressure 900 pounds. This is the second oil well to be completed in the field and its performance is expected to encourage additional development which has been held up due to several abandonments made shortly after the field was discovered. The company has made two locations, No. 2 Guinn south of the discovery well and No. 2 Mary E. Langham located 933 feet east of No. 1 Langham in the C. Williams Survey. To the northwest Glenn H. McCarthy, Inc., is moving in material for No. 1 J. B. Langham, situated 175 feet south of the north line and 96 feet east of the west line of an 18-acre tract in the H. Williams Survey.

Magnolia Petroleum Co. No. 1 Funchess, a wildcat situated south of the Amelia field in the H.T.&B. Survey is drilling in shale below 7,570 feet. Sand with a slight oil odor was cored from 7,073-75 feet. To the west on the Nome Prospect Shell Petroleum Corp. has made location for No. 1 F. H. Carpenter, being 3,400 feet east of the west line and 466 feet north of the south line of a 402-acre tract in the M. E. Pivoto Survey. The Sun Oil Co. has drilled several tests in this area, all of which encountered several showings of oil and gas, but due to heaving shale trouble they were abandoned.

The Lakeview Prospect, Wharton County, proven for gas production last week by the completion of Smith and McDannald No. 1 Mitchell received a new location by the announcement for the same operators No. 1 A. Priesmeyer located about a half mile northwest of the gas well in section 10 of the Charles Riley Survey. It will be drilled to a depth of 5,500 feet or to the approximate producing level of the Pickett Ridge field and if no sands are encountered it will be drilled to around 6,200 feet where a second sand is expected.

Conroe Outpost

On the north flank of the Conroe field, Montgomery County, South Gulf Oil Co. has cemented surface casing on No. 1 Brent, an interesting outpost test located about 1,000 feet north of production in the D. W. Collins Survey. The well is situated on farmed out acreage held by Tide Water Oil Co. and Houston Oil Co. and the operators will test the upper and lower horizons of the Cockfield sand. It is north of Houston Oil Co. and others No. 1 Brent which was completed at a plugged back depth of 5,110 feet for a large gas well.

Pickett Ridge

The first development to be started in the Pickett Ridge field, Wharton County, by independent operators was announced by the Crown Central Oil Co. and Adrian Moore. Crown Central Oil Co. No. 1 J. J. Rod is located northeast of the field in Block 13, W. C. R.R. Survey, while Adrian Moore No. 1 W. P. Wilbeck is situated to the southeast in the J. Teleformer Survey. The Texas Co., which has been the only operating company completed three producers the past week and made locations for two wells being No. 19-A Pierce and No. 21-A Pierce, both being located in the I.&G.N. Survey No. 38.

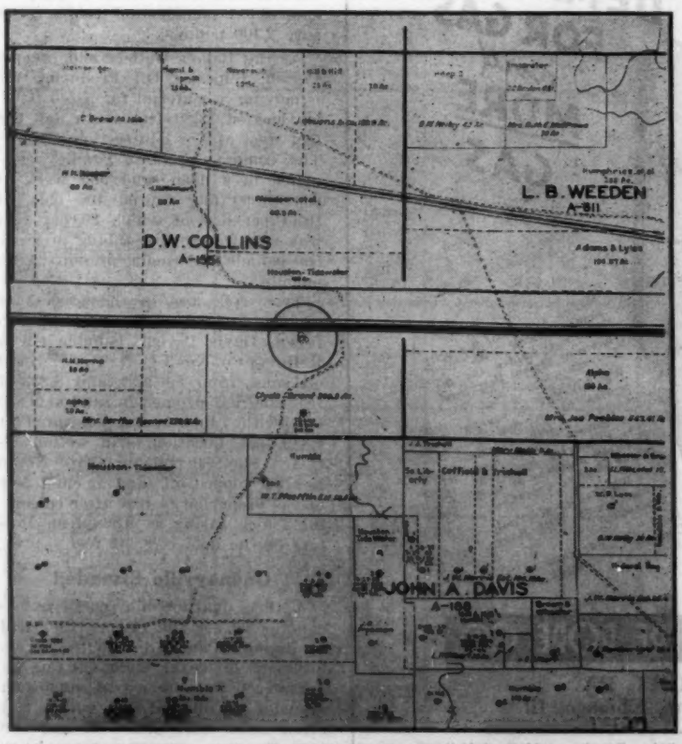
Atlantic Oil & Producing Co. No. 1 Hardy located about 3,600 feet north of the discovery well of the Hardin field, Liberty County, was tested through perforated casing from 7,980-94 feet and on a 15-minute drill stem test showed 1,500 feet of fresh water with oil cut, 360 feet of drilling mud and 2,700 feet of salt water. The perforations have been cemented and the hole plugged back to 7,775 feet where another test will be made.

Gulf Oil Corp. No. 1 Fairfield located on the Lockridge Prospect, Brazoria County, was tested at a total depth of 8,398 feet and it flowed gas, salt water with a trace of oil and it has been killed and the operators are preparing to fish for the drill stem which became stuck when the sand was encountered. It will probably be plugged back to 6,274 feet where it showed for a wet gasser several weeks ago. Location is in the A. Robinson Survey. In the same county but in the Old Ocean field, Harrison and Abercrombie are moving in a rig for No. 1 Armstrong, situated north of the company's producers in the Polly and Chance Survey, abstract 119.

Salt Dome Oil Co. and Gem Oil Co. are plugging back No. 2 Lawrence to the Marginulina sand where it was originally completed for a producer before it was deepened to the Frio sand. It is located on the Cotton Lake Prospect, Chambers County, and will be plugged back from a depth of 7,000 feet to around 6,600 feet. To the northeast in the Turtle Bay field, Stanolind Oil & Gas Co. No. 1 State was swabbed in and flowed 155 bbls. in 24 hours through a quarter-inch choke with tubing pressure 180 pounds and casing pressure 760 pounds. The same company's No. 2 Middleton reset screen which became sanded up and the operators are now swabbing.

South Houston Extended

The South Houston field, Harris County, was extended approximately 1,200 feet to the northwest by the completion of Dick Schwab and others No. 1 Theo Bennett which flowed 410 bbls. per day through a quarter-inch choke with tubing pressure 300 pounds and casing pressure 750 pounds. The oil sand was topped at 4,681 feet and it is producing from a depth of 4,776 feet. Location is in the center of tract 26 in the H.T.&B. Survey. West of Houston in the Sat-



Interesting location of South Gulf Oil Co. No. 1 Brent located on the north flank of the Conroe field in Montgomery County

(Map by W. W. Zingery, Houston, Tex.)

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suma area, Amerada Petroleum Corp. and others No. 1 Dopslauf is drilling in shale below 5,765 feet and is reported to be about normal.

Production of Pools

Following was the estimated average daily production of the principal Gulf Coastal pools for the week ending May 9:

TEXAS COAST

Anahuac	7,670
Barbers Hill	17,327
Conroe	45,537
Hastings	6,834
High Island	6,739
Humble	3,429
Manvel	10,430
Mykawa	3,237
Thompson	10,687
Greta	16,054
Plymouth	8,654
Saxet	8,739
Saxet Heights	5,587
Miscellaneous	96,811
Total	247,738

LOUISIANA COAST

Lafitte	4,918
Bosco	14,150
Caillou Island	10,750
East Hackberry	8,120
Gillis	15,530
Iowa	19,510
Lake Barre	9,878
Leesville	14,787
Roanoke	5,530
Sulphur	6,956
Miscellaneous	36,598
Total	146,727
Total Gulf Coast	394,464

South Louisiana

The east and western limits of the Tepetate field in Acadia Parish, Louisiana, were defined by three wells the past week. On the east side of the field, Loffland Brothers abandoned No. 1-A and 1-B Bowles at 8,378 and 8,703 feet respectively, while to the west General Crude Oil Co. No. 1 Vincent in section 31-7s-2 was drilling in shale below 8,554 feet after it failed to encounter the 8,300-foot sand and will probably be abandoned during the week. Continental Oil Co. No. 1-A Sonnier in section 29, was completed through perforated casing from 8,298 feet and flowed 296 bbls. in 13½ hours with casing pressure 2,400 pounds and tubing pressure 2,100 pounds.

At the Bayou Mallet field, Acadia Parish, Superior Oil Producing Co. is moving in material for No. 3 Bradley located 1,380 feet south and 348 feet west of No. 1 in section 47-7s-1e. The company's No. 2 Bradley completed in a deep sand last week at 6,996-7,000 feet flowed 105 bbls. of fluid per day of which 20 per cent was salt water with tubing pressure 500 pounds and casing pressure 1,000 pounds.

Two wells are in the process of completion at the Roanoke field, Jefferson Davis Parish, Humble Oil & Refining Co. No. 3 C. N. Taylor cored oil sand from 8,819-31 and 8,833-37 feet, and is bottomed in sand at 8,850 feet with 7-inch casing cemented at 8,849 feet. Location is in section 12-9s-4w. Shell Petroleum Corp. No. 5 Kratzer topped oil sand at 8,671 feet and is preparing to test after cementing 7-inch casing at 8,668 feet. Bottom of the hole is 8,681 feet.

Cheneyville Extended

A three-quarter mile north extension looms for the Cheneyville field in Rapides Parish due to the showing made by Texas Eagle Oil Co. No. 1 State. It is bottomed in sand with an odor of oil and gas which was cored from 5,691-5,703 feet and the operators are preparing to make a drill stem test. At this depth the bottom of the hole is somewhat higher than the wells to the south and if productive it will add much importance to this field which has received little attention since its discovery the latter part of December.

Herton Oil Co. No. 1 Carter located 1,282 feet east of production in the Jeanerette field, St. Mary Parish, missed the 7,500-foot sand and is drilling in shale below 8,100 feet. It will probably be drilled to the Oligocene sand and if nothing of importance is found, it will be plugged back to approximately 6,700 feet where it showed several hundred feet of oil on a drill stem test.

Tide Water Oil Co. No. 2 Smedes located in the St. Martinsville field, St. Martin Parish, has been completed for a wet gasser in sand from 6,640-55 feet. There was no gauge on the volume of the gas, but the tubing pressure was 1,525 pounds and it is making approximately 2 bbls. of distillate per day. The operators are flowing the well through various chokes in hopes that it will start making crude oil. Continental Oil Co. No. 1 fee in section 18 was drilled to a depth of 8,150 feet and the hole has been plugged back to 7,370 feet where it will be sidetracked to straighten the hole.

Wildcats

Strake Oil Corp. has made location for a second wildcat to be drilled on the Woodlawn Prospect in Jefferson Davis Parish. It is No. 1 Miller, located northeast of the company's No. 1 Calcasieu National Bank which was abandoned last year below 8,505 feet after encountering several showings of oil and gas below 8,000 feet. Location is in section 7-9s-5w.

There are several wildcats in Coastal Louisiana that have reached interesting depths and are being watched with much interest. On the Esterwood Prospect, Acadia Parish, Magnolia Petroleum Co. No. 1 Homeseekers Development Co. is drilling in shale below 7,000 feet. Location is in section 54-10s-1w. On the Reeves Prospect, Allen Parish, Humble Oil & Refining Co. No. 1 J. A. Bell is drilling in shale below 6,577 feet.

Cameron Parish

At the Big Lake field, Cameron Parish, Magnolia Petroleum Co. No. 1 Hebert, three-quarters of a mile south of the company's No. 1 Broussard, the discovery well in section 13-12s-9w is drilling in shale and lime below 6,216 feet after encountering a show of oil from 5,809-15 feet.

British Columbia Test

Columbia Oils, Ltd., of Vancouver, British Columbia, is arranging to resume work on its test in the Sage Creek area in the southeastern section of the province. The test shut down last fall at 4,836 feet. Shows of oil and gas were met at 134, 2,370, 3,119, 3,465, 3,776 and 4,100 feet, and considerable larger shows between 4,501 and 4,836 feet. A test by swabbing by means of 3,000 feet of 3-inch tubing with packer set at 2,400 feet resulted in oil, gas and drilling fluid being forced 50 to 60 feet over the 94-foot derrick, and crude oil rose over 700 feet in the hole when the well stood idle over night. Formations are still too tight to make a flowing well and it is planned to deepen in hope of getting a porous horizon. The isolated location and lack of transportation facilities have added to the difficulty of the work.

Kansas Developments

WILDCAT IN BARTON COUNTY BIG LANSING LIME PRODUCER

By DAL DALRYMPLE

The new wildcat strike in Barton County, Kansas, Simpson & Noble, Atlantic Oil Producing Co. and Franco-Central Oil Co. No. 1 Hiss, C NW NE section 31-20-13w, proved a real sensation in Kansas oil circles at the week-end, as it took potential test with the rate of flow increasing in the latter hours of the test. In 20 hours it flowed 969 bbls. after acidizing Lansing lime at 3,287 feet, total depth, but did not complete the 24-hour test because of lack of storage. In the last two hours of the test it flowed 129 bbls. and 157 bbls. respectively. When the control head was closed the wildcat was flowing at the rate of 3,768 bbls. a day. In the early hours of the test it averaged 30 bbls. an hour, then suddenly increased to 100 bbls. an hour for a short period, and then continued to increase until the 157-bbl. hourly rate was attained. The well is located 6 miles south of Great Bend, less than 1 mile from the Stafford County line.

Continental Oil Co. No. 1 Thompson, C E half E half SW section 13-18-26w, wildcat in Ness County, was showing as a new pool opener or an extension of the Aldrich pool. It had Siliceous lime at 4,446 to 4,449 feet, total depth and had considerable oil in the hole. Operators were making connections and preparing to drill a few feet deeper before completing. It was running about 25 feet higher on structure than the discovery and only producer in the Aldrich pool, about 1½ miles northeast.

A new gas pool has been discovered at Rose Spring Drilling Co., John LeBosquet and Kansas Oil & Gas Corp. No. 1 Jacobs, SW SE NW section 8-16-17w, wildcat in Rush County, about 14 miles northeast of La Crosse. It had the pay at 3,532 to 3,535 feet, total depth, and gas was estimated at 5,000,000 feet daily. It had not been determined if gas was coming from Reagan sand or Conglomerate. It was shut down for orders. The location is 23 miles northwest of the Otis gas field and 6 miles southeast of the Ruder oil pool in Ellis County.

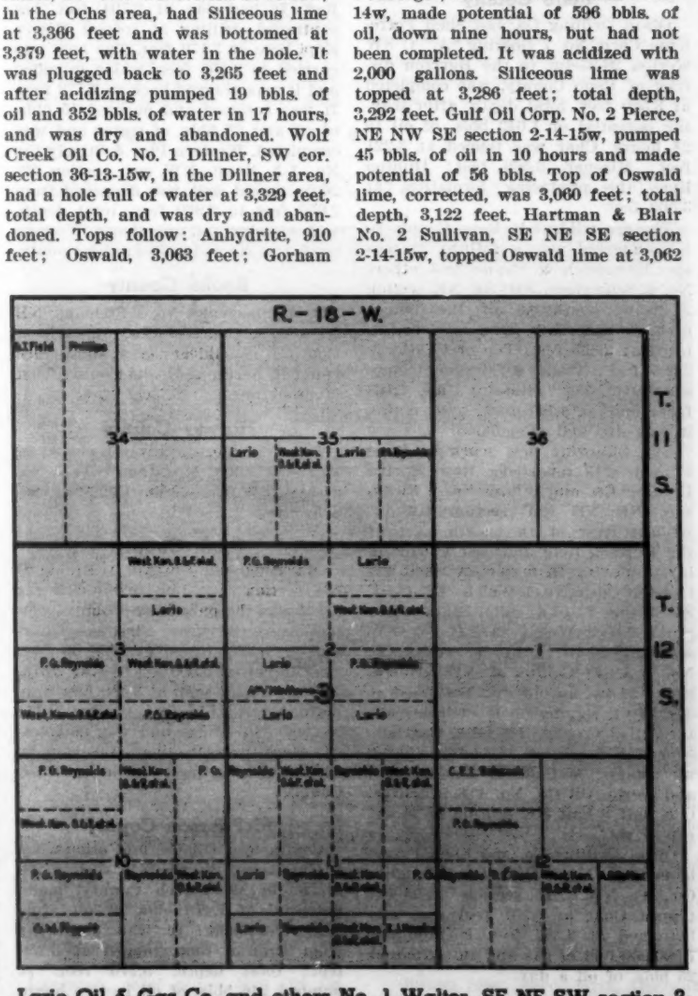
Russell County

Bidgeport Machine Co. No. 4 Witt, NE NE SW section 3-14-15w, in the Gorham area of Russell County, pumped and flowed 2,388 bbls. of oil in 24 hours and was completed at 2,870 feet, total depth. Production was from Topeka lime, topped at 2,765 feet. Anhydrite was topped at 905 feet. Empire Oil & Refining Co. No. 3 Crawford, NW SW SW section 2-14-15w, in the Sullivan area, had Gorham sand at 3,284-86 feet, total depth, pumped 550 bbls. of oil in 20 hours, made potential of 755 bbls., and was completed. Anhydrite was topped at 888 feet; Oswald lime, 3,034 feet. Texas Co. No. 1 Ginther, SE SE SW section 19-12-15w, in the Fairport area, made potential of 649 bbls. after acid treatment and was completed at 3,028 feet, total depth. Oswald lime, the producing horizon, was topped at 2,973 feet. Central Petroleum Co. No. 1 Boxberger "B," NE cor. section 35-15-15w, was treated with acid, made potential of 543 bbls. of oil and was completed. Anhydrite was topped at 933 feet; Oswald lime, the producing formation, was found at 3,140 feet; total depth, 3,151 feet.

Bridgeport Machine Co. and D. H. Lauck No. 1 Wyckoff, SE NW NE section 27-11-13w, wildcat in northern Russell County, was dry and abandoned at 3,460 feet, total depth. It topped Anhydrite at 710 feet; Topeka lime, 2,665 feet; Oswald, 2,955 feet, and had a hole full of water at 3,015-20 feet. Derby Oil Co. No. 1 Karst, SW NW NE section 27-15-14w, in the Ochs area, had Siliceous lime at 3,366 feet and was bottomed at 3,379 feet, with water in the hole. It was plugged back to 3,265 feet and after acidizing pumped 19 bbls. of oil and 352 bbls. of water in 17 hours, and was dry and abandoned. Wolf Creek Oil Co. No. 1 Dillner, SW cor. section 36-13-15w, in the Dillner area, had a hole full of water at 3,329 feet, total depth, and was dry and abandoned. Tops follow: Anhydrite, 910 feet; Oswald, 3,063 feet; Gorham sand, 3,315 feet; Siliceous lime, 3,318 feet.

New work in Russell County was as follows: Texas Co. No. 2 Ginther, NE SE NW section 19-12-15w, location; Equity Gas Co. No. 1 Harbauh, NW NE SW section 19-13-12w, wildcat, cellar; Bridgeport Machine Co. No. 5 Witt, NW NW SW section 3-14-15w, rigging up; same operator's No. 6 Witt, SE NE SW section 3-14-15w, cellar; National Refining Co. No. 2 Reinhardt "C," SW NW SE section 25-14-15w, location; Skelly Oil Co. No. 1 Henry Boxberger, NW NW NE section 33-13-14w, location; Wakefield & Armer No. 2 Hall, NW SW SE section 36-14-15w, moving in material; Central Petroleum Co. No. 1 Foster "B," SW SW NE section 3-14-15w, an old well being deepened, drilling at 3,140 feet.

Hartman & Blair and others No. 1 Boxberger, NE NE NW section 33-13-14w, made potential of 596 bbls. of oil, down nine hours, but had not been completed. It was acidized with 2,000 gallons. Siliceous lime was topped at 3,286 feet; total depth, 3,292 feet. Gulf Oil Corp. No. 2 Pierce, NE NW SE section 2-14-15w, pumped 45 bbls. of oil in 10 hours and made potential of 56 bbls. Top of Oswald lime, corrected, was 3,060 feet; total depth, 3,122 feet. Hartman & Blair No. 2 Sullivan, SE NE SE section 2-14-15w, topped Oswald lime at 3,062 feet; had pay at 3,085-90 feet, and pumped 213 bbls. of oil in 24 hours. National Refining Co. No. 1 Reinhardt "C," NW NW SE section 25-14-15w, made potential of 467 bbls. before acidizing, and after treatment pumped 378 bbls. in 16 hours. Siliceous lime was topped at 3,179 feet; total depth, 3,185 feet. Hartman & Blair and others No. 1 Gurney "B," SE cor. section 23-14-14w, was acidized and made potential of 456 bbls. of oil in 17 hours. It was bottomed at 2,978 feet.



Lario Oil & Gas Co. and others No. 1 Walter, SE NE SW section 2-12-18w, was showing as a new pool opener in Ellis County, Kansas

(Mid-Continent Map Co., Wichita, Kans.)

Estimated Production

Estimated daily average production in Kansas for the week ending May 9 and for the preceding week is as follows:

	Barrels	
	May 9	May 2
Oxford City	7,650	7,575
Burrton	14,100	13,675
Ritz-Canton	6,725	6,675
Hollow-Nikkel	4,625	4,600
Voshell	3,325	3,300
Ellsworth County:		
Lorraine-So. Lorraine	6,486	8,675
Other pools	1,145	1,477
Rice-Barton Counties:		
Chase	10,549	10,378
Raymond	2,709	3,396
Silica	9,778	10,775
Keesling	2,176	2,632
Miscellaneous Rice	3,941	3,808
Miscellaneous Barton	2,396	2,324
Russell County:		
Fairport	3,145	3,128
Gorham	4,584	5,374
Russell	3,402	4,060
Sullivan	2,976	3,582
Other pools	6,540	12,400
Sedgwick County:		
Valley Center	1,420	1,400
Greenwich	1,406	1,422
Robbins	1,512	1,458
Eastborough	856	846
Other pools	524	501
Ellis County	2,021	1,714
Kingman County	592	572
Stafford County	2,110	2,525
Greenwood County	9,750	9,250
Butler County	17,980	18,240
Other fields	20,778	16,852
Total Kansas	155,200	162,625

Rice County

Skelly Oil Co. No. 5 Graham, SE cor. section 16-20-10w, in the Raymond area of Rice County, made potential of 2,539 bbls. of oil after acidizing, and was completed at 3,349 feet, total depth. Siliceous lime was topped at 3,346 feet. Empire Oil & Refining Co. No. 2 Janssen, SE NE NW section 3-18-8w, topped Siliceous lime at 3,256 feet, was bottomed at 3,262 feet, made potential of 1,050 bbls. of oil and was completed. It is in the Geneseo district of northern Rice County. Derby Oil Co. No. 1 Callis, SE SE SW section 32-19-9w, in the Chase pool, made potential of 140 bbls. of oil, with 21 bbls. of water, after acid treatment and was completed. Siliceous lime, the producing formation, was topped at 3,239 feet; total depth, 3,276 feet.

Empire Oil & Refining Co. No. 1 Burns, SW NW SW section 15-20-10w, topped Simpson at 3,339 feet; Siliceous lime, corrected, 3,378 feet; total depth, 3,383 feet. It made potential of 465 bbls. of oil, with 50

bbls. of water, and was completed. W. E. Witt No. 1 Hill, SE SE NW section 3-20-9w, wildcat between Lyons and the Chase area, was dry and abandoned at 3,252 feet, total depth. Kansas City lime was topped at 2,854 feet; Siliceous lime, 3,222 feet. Gulf Oil Corp. No. 1 Shubert, SE SW SE section 9-20-10w, was dry and abandoned at 3,453 feet, total depth, in Siliceous lime topped at 3,428 feet. Salt water appeared in cores. Simpson formation was topped at 3,384 feet.

The following new work in Rice County was reported: Continental Oil Co. and Empire Oil & Refining Co. No. 2 Nickel, NW NW SW section 13-18-8w, rotary rig; Lebow and others No. 3 Callis, NW NW SE section 16-19-9w, building rig; Shell Petroleum Corp. and others No. 1 Hafermann, C N half N half SE section 6-19-9w, wildcat on subsurface trend southwest of the Ploog pool, building rotary rig; Phillips Petroleum Co. and Indian Territory Illuminating Oil Co. No. 11 Krampe, NE NE SE section 31-19-10w, location; Gulf Oil Corp. No. 6 Hartle, SE NE NW section 15-20-9w, spudded; Mid-Continent Petroleum Corp. No. 8 Hartle, SE SE NW section 15-20-9w, building rotary rig; Garden Brothers No. 1 Hauschild, SW SW SE section 10-21-7w, cellar; Derby Oil Co. No. 1 Brown, NW NW SW section 22-21-7w, location; Stanolind Oil & Gas Co. No. 4 Specht, NE SW NE section 6-20-10w, location.

Vickers Petroleum Co. and others No. 3 Guldner "A," NE NW NW section 16-18-9w, had Siliceous lime at 3,231-34 feet, total depth, and swabbed at the rate of 25 bbls. of oil an hour. Mid-Continent Petroleum Corp. No. 3 Risse, NW SE NE section 6-20-10w, topped Siliceous lime at 3,292 feet; was bottomed at 3,299 feet and swabbed at the rate of 65 bbls. of oil an hour. Saco Oil Co. and Gulf Oil Corp. No. 2 Foote, SW SE NE section 7-20-9w, had Siliceous lime at 3,270-86 feet, total depth, and swabbed 13 bbls. of oil an hour. Gulf Oil Corp. No. 5 Hartle, NE NW NW section 15-20-9w, was acidized and pumped 221 bbls. of oil in 11 hours; total depth, 3,260 feet.

Barton County

Completions in Barton County included four producers in the Silica area and two wildcat failures. Mid-Continent Petroleum Corp. No. 5, NW SW SE section 25-19-11w, made potential of 2,199 bbls. of oil after acidizing. Top of Siliceous lime was 3,281 feet; total depth, 3,297 feet. Continental Oil Co. No. 8 Risse, C W half NE SE section 36-19-11w, topped Siliceous lime at 3,264 feet; total depth, 3,274 feet. After acidizing with 4,000 gallons, it made potential of 1,983 bbls., completed. Gulf Oil Corp. No. 4 F. J. Wendel, SE NE NE section 36-14-11w, made potential of 1,154 bbls. of oil, with 11 per cent water, and was completed. It had Siliceous lime at 3,278-99 feet, total depth, and produced 1,086 bbls. of oil and 356 bbls. of water. It was plugged back to 3,293 feet and acidized before completing. Phillips Petroleum Co. No. 4 Matzek, C E half SW NE section 36-19-11w, had Siliceous lime at 3,281 feet; total depth, 3,300 feet; made potential of 1,552 bbls. and was completed.

Arch E. Merriam No. 1 Soeken, SW SW SE section 21-17-11w, wildcat in northeastern Barton County, was dry and abandoned with a hole full of water at 3,297-3,300 feet, total depth. Kansas City lime was topped at 2,994 feet; Conglomerate, 3,268 feet; Siliceous lime, 3,271 feet. It had showings of oil at 3,273-75 feet. C. L. Price and others No. 1 Ehrlich, NW NW SE section 10-16-13w, an old wildcat in northern Barton County that was deepened from 3,361 feet, was dry and abandoned at 3,442 feet, total depth.

New operations in Barton County follow: Mid-Continent Petroleum Corp. No. 6 Matzek, NE SW SE section 25-19-11w, building rotary rig; Sinclair Prairie Oil Co. No. 2 Isern, NE SE SW section 25-19-11w, rigging up rotary; Phillips Petroleum Co. No. 5 Matzek, SW SW NE section 36-19-11w, rotary rig; Texas Co. No. 3 Schmidt, SE SE NW section 36-19-11w, location; Bradley Oil Co. No. 1 Scheufler, NW NE SW section 16-20-11w, building rig.

Sinclair Prairie Oil Co. No. 1 Isern, SE SE SW section 25-19-11w, pumped 115 bbls. of oil in four hours after plugging back from 3,322 feet, where water intruded, to 3,312 feet. Before deepening from 3,311 feet, it made potential of 428 bbls. of oil following acidization. Mid-Continent Petroleum Corp. No. 4 Schmidt, SE NE SW section 36-19-11w, pumped at the rate of 80 bbls. of oil an hour, after acidizing and making potential of 913 bbls. It was bottomed at 3,276 feet. Simpson & Noble and Atlantic Oil Producing Co. No. 1 Hiss, C NW NE section 31-20-13w, wildcat, was bottomed at 3,290 feet and swabbed 230 bbls. of oil in 24 hours.

Reno County

Olson Drilling Co. and Shell Petroleum Corp. No. 7 Goering "A," C SW section 26-23-4w, in the Burrton district of Reno County, was completed at 3,500 feet, total depth, after making potential of 1,643 bbls. of oil in 24 hours. Chat was topped at 3,221 feet; Misener, 3,569 feet; Hunton lime, the producing formation, at 3,560 feet.

The one wildcat in Reno County to be completed was a failure. It was the Helmerich & Payne and others No. 1 Schwaiger, SW SE NE section 27-26-5w, southwest of the Hilger area. Kansas City lime was encountered at 2,855 feet. Top of Chat was 3,625 feet; Viola, 4,006 feet; Simpson, 4,032 feet; Siliceous lime, 4,103 feet; and at 4,147 feet, total depth, it was dry and abandoned.

The following new work in Reno County was reported: Rose Spring Drilling Co. and others No. 1 Swansen, NE NE NW section 1-23-5w, wildcat west of the north part of the Burrton field and east of Hutchinson, moving in material; Shell Petroleum Corp. No. 1 Welch "B," C SE SE section 4-24-4w, cellar; same operator's No. 2 Welch "A," C SW SW section 9-24-4w, location; Texas Co. No. 1 A. F. Collins, C NE NE section 9-24-4w, an old well bottomed at 3,326 feet, rigging up to drill deeper; Derby Oil Co. No. 4 Seedle, C S half N half SW section 17-24-4w, rigging up rotary; McPherson Drilling Co. and Derby Oil Co. No. 4 Scheuchzer, C N half S half SW section 17-24-4w, rotary rig.

Olson Drilling Co. and Shell Petroleum Corp. No. 2 Hutchinson Lumber Co., C NW NE section 24-23-4w, topped Chat at 3,251 feet and was bottomed at 3,382 feet. It produced 7,000,000 feet of gas and an estimated 25 bbls. of oil a day.

Ellis County

Winkler & Koch and others No. 1 Bemis, NE cor. section 21-11-17w, in the Bemis district of Ellis County, topped Siliceous lime at 3,346 feet, corrected, and was completed at 3,351 feet, total depth. It made potential of 1,686 bbls. of oil. Other tops follow: Anhydrite, 1,048 feet; Topeka lime, 2,929 feet.

Twin Drilling Co. No. 1 Reidel, SW SW NE section 27-13-16w, wildcat in eastern Ellis County, northwest of the Gorham pool, was dry and abandoned at 3,536 feet, total depth, with water in the hole. Oswald lime was topped at 3,212 feet; Conglomerate, 3,471 feet; Siliceous lime, 3,507 feet.

New work in Ellis County includes a wildcat in the southeastern part of the county, just north of the Rush County line. It is the James Brouk and others No. 1 Jacobs, NW NW SE section 31-15n-16w, on a subsurface trend. Rig was being built. The only other new Ellis County test was the Phillips Petroleum Co. and others No. 1 S. Bertha, C W half W half SE section 5-12-17w, building rig.

Stafford County

Stanolind Oil & Gas Co. and others No. 4 Heyen "B," NE SE NE section 31-22-11w, in the Richardson area of Stafford County, had dug cellar. It was the only new operation reported in the county.

Sedgwick County

The only producer completed in Sedgwick County the past week was the Faulkner and others No. 1 Underwood, SW cor. section 23-25-1w, an old well that was deepened from 1,025 feet. It had pay at 2,704 feet, but continued drilling at topped Mississippi lime at 3,170 feet. The hole was carried to 3,253 feet, water intruded and it was plugged back to 2,713 feet. It was acidized and pumped 15 bbls. of oil and 25 bbls. of water and was completed. Western Pipe & Supply Co. No. 1-A Rapp, NW cor. section 22-26-2e, an old well, was deepened from 2,955 feet to 2,960 feet, total depth, and was dry and abandoned. No new work was started in Sedgwick County.

Rooks County

J. A. Shoemake No. 1 Stebbins, NE NE SW section 26-7-17w, was a location for a wildcat on a subsurface trend in northern Rooks County, east of Stockton.

Harvey County

One new operation was reported in Harvey County. Marathon Oil Co. No. 2 Hege, SW cor. section 13-22-2w, was a location.

Rush County

Marathon Oil Co. No. 1 Brack, C SW section 24-18-16w, in the Otis gas area, was the only Rush County completion of the week. First gas showing was encountered at 2,355-65 feet. Gas measured 6,500,000 feet at 2,373-78 feet. It had sand at 3,500 feet, was bottomed at 3,515 feet, produced 27,983,000 feet of gas and was completed. Rock pressure was 940 pounds. There was no new work in Rush County.

McPherson County

Continental Oil Co. and others No. 1 Huntsman, SE SE NW section 29-21-1w, in McPherson County, made potential of 1,476 bbls. of oil after acid treatment. It was producing from Hunton lime, topped at 3,250 feet; total depth, 3,276 feet. It pumped 246 bbls. of oil in two hours and 15 minutes before acidizing.

Location was staked for one new McPherson County test. It was Continental Oil Co. and others No. 3 A. K. Graber, NW NW SE section 29-21-1w.

Barber County

Barbara Oil Co. deepened the No. 1 Angell, C NE NE section 23-33-13w, in the Medicine Lodge area of Barber County, without result. It had water in Siliceous lime at 4,937-39 feet, total depth, and was dry and abandoned.

Butler County

One producer and two dry holes was Butler County's contribution to the list of completions. Pryor & Lockhart and others No. 3 Gunther, NW SW NE section 29-26-7, topped lime at 2,745 feet and pumped 170 bbls. of oil in 24 hours from pay at 2,748-58 feet, total depth. Jones and others No. 1 Sandberg, NW NW SE section 11-28-6, was dry and abandoned at 825 feet, total depth. Perdew and others No. 1 Sandberg, SW NW NE section 11-28-6, had a hole full of water at 3,208-10 feet, total depth, and was dry and abandoned. Viola lime was topped at 3,156 feet; Simpson, 3,159 feet; Wilcox sand, 3,168 feet; Siliceous lime, 3,179 feet. No new tests were started in Butler County.

Sumner County

The one producer of the week completed in Sumner County was the Sinclair Prairie Oil Co. No. 7 Kamis, NE SE SW section 28-31-1w, in the Wellington area. It made potential of 343 bbls. of oil after acidizing. Chat topped at 3,647 feet. Total depth was 3,681 feet.

Slick and others No. 1 Murphy, NE NE SE section 32-31-1w, was the only new operation in Sumner County. It was a rotary rig.

Cowley County

D. D. Mickleson and others No. 1 Wallace, SW SE SE section 10-33-4, Cowley County wildcat, was abandoned at 35 feet, total depth.

New work in Cowley County follows: Texas Co. No. 2 Wheeler, SW SE NW section 35-30-4, location; Lloyd, Frost and Study No. 2 McKinley, SW NW NE section 33-31-3, rotary rig; Benedum & Trees No. 1 Carson, SW SW NW section 8-30-4, wildcat north of the Trees area, was rigging up machine.

Woodson County

No completions were reported in Woodson County, but work was starting at two new tests. C. L. Sheedy No. 6 Klick, NE SW SE section 20-25-14, was rigging up machine; C. L. Sheedy and others No. 1 Fuhhage, NE NW SW section 27-25-14, wildcat, was a location.

Saline County

James Brouk and others No. 1 Othelander, NE NW SE section 10-16-3w, wildcat near Assaria in Saline County, was building rig. It is 10 miles south of Salina, on a block assembled by L. H. Walker. It is located one-half mile southeast of a 20-bbl. Viola lime wildcat drilled several years ago by Stanolind Oil & Gas Co. in the Olson area.

Greenwood County

Western Kansas Oil & Refining Co. and Phillips Petroleum Co. No. 1-A Pees, C N half N half SE section 30-22-11, in Greenwood County, was dry and abandoned at 2,165 feet, total depth. It had sand at 2,018 feet.

Morris County

Ryan and others No. 1 Wiesse, C

(Continued on Page 275)

North Louisiana, Arkansas

MAY OPEN NEW POOL SOUTH OF RODESSA, CADDO COUNTY

By
H. S. NORMAN

SHREVEPORT, La., May 11.—The possibility of opening a new deep gas, distillate or oil producing horizon in western Caddo Parish, 23 miles west of Shreveport and 30 miles south of Rodessa, which was accompanied by an intensive leasing campaign in the vicinity, stood out in North Louisiana and Southern Arkansas field development last week.

The test responsible for the interest in the old Blanchard-Waskom gas producing area west of Shreveport is Pyramid Oil & Gas Co. (Belchic & Lasky) and United Gas Public Service Co. No. 1-A S. R. Wheeler, 1,320 feet south and 1,500 feet west of the NE cor. of section 16-18-16. The test was last reported coring ahead below 5,025 feet. Rumors were current that operators cored 20 feet of porous lime above 4,850 feet, but it was not definitely disclosed what the lime contained. Some reports were that the wildcat test gave evidence of producing dry gas, others were that it would make distillate with gas, and still others were that it will produce oil. Due to the inconsistency of reports, there remained the all important question of a definite test.

Although Pyramid and United hold nearly all acreage within a mile and a half of the test, there was one sale at $100 per acre reported within a mile of the hole. Several deals were closed by O'Brien Brothers of Shreveport for protection in the area at prices ranging from $50 to $60 per acre.

Meanwhile, Gulf Oil Corp. continued to add to its block southeast of the Pyramid-United test at Cross Lake at prices ranging up to $7.50 per acre. The Texas Co. and Devonian Oil Co. purchased scattered acreage in the same territory. Near Lewisville in Lafayette County, Arkansas, Erwin & Leach relinquished operation of No. 3 Bodcaw Lumber Co. to Ohio Oil Co. at 7,000 feet and the test is now proceeding below 7,214 feet. Operators encountered anhydrite, regarded by some as the zone overlying the Permian lime pay in the Phillips well at Smackover at 7,176-80 feet.

In Cass County

Four and a half miles southwest of nearest production in the Rodessa pool and in the southeastern part of Cass County, American Liberty Oil Co. No. 1 Rambo, in the John Reeves Survey, awaited final decision. Operators plugged the hole back from 6,072 to 6,010 feet before cementing casing at 5,993 feet. After drilling plug, washing for a period failed to develop production. Operators are swabbing casing set at 5,993 feet with the possibility existing that part of the saturation may have been excluded due to a correction in measurement.

Meanwhile, United Gas Public Service Co., the largest operator in the pool, made location for No. 1 L. J. Cunningham, 330 feet north and 697 feet west from the southeast corner of 220 acres in the W. Robinson Survey, half a mile south of the American Liberty No. 1 Rogers, a gas and distillate producer. The Texas Co. No. 1 E. E. Hall, nearly midway between the American Liberty No. 1 Rogers and the same company's No. 1 Marcus Rambo, is drilling below 4,500 feet and is due to reach important markers this week. With elevation of 298 feet, it topped red beds at 3,477 feet and had base of chalk rock at 2,589 feet.

Rodessa Results

Eight oil wells were completed during the past week in the Rodessa pool of Caddo Parish and the production from that area climbed to about 54,500 bbls. per day. This yield is high compared to 50,750 bbls. per day assigned to the pool for May by the Louisiana Conservation Department. With allowable of 350 bbls. per day for each well, completions during remainder of the month are expected to swell the total output to approximately 70,000 bbls. daily.

In all of South Arkansas and North Louisiana there were 22 completions, including three temporary abandonments, 133 drilling operations, 16 rigging up, 21 derricks and 32 locations.

Tensas Parish's Possibilities

The shallow possibilities of Tensas Parish, bordering the Mississippi River, demanded some attention last week by testing of gas, estimated as high as 5,000,000 feet per day, in Howard M. Jones No. 1 Chicago Mill & Lumber Co., section 30-12n-10e, which was last reported waiting on casing at 773 feet. The gas production is reported from the base of Jackson or the top of Cockfield. Operators will complete as a gasser for fuel and drill probably three more shallow tests on the structure to define the top before trying for production in the Wilcox, expected at about 3,000 feet. (Wilcox sand in Louisiana has no structural relation to the Wilcox sand of Oklahoma.)

In Webster Parish, J. P. Evans and others No. 1 Crichton heirs, north of Heflin and in section 35-18-9, is reported shut down at 5,495 feet awaiting results of Schlumberger test. Operators claim to have cored porous soft sand at 5,288-91 and at 5,462-68 feet. Shows higher in the hole are believed the result of lubricating stuck drill stem. Reaming was under way with view of setting casing (6⅝-inch) at 5,270 feet.

Herman L. Brown and others No. 1 S. Gardner, in section 10-17-4w, offsetting the Lide & Greer discovery wet gasser in Lincoln Parish, is believed to have missed the upper gas sand and operations are temporarily shut down at 5,732 feet after running Schlumberger, which showed sand at 5,664 to 5,671 and at 5,678 to 5,701 feet. Operators are conferring to decide on setting casing to test the sand or to continue in search of lower pay.

Estimated Production

Estimated daily gross production all companies week ending May 8, 1936:

NORTH LOUISIANA

Bellevue	450
Caddo Light	3,935
Caddo Heavy	2,445
Converse	1,110
Cotton Valley	375
De Soto and Red River	1,320
Elm Grove	470
Haynesville	3,415
Holly	140
Homer	2,635
Pleasant Hill	155
Rodessa	52,865
Sarepta-Carterville	410
Urania	2,880
Zwolle	1,250
Total	73,855

ARKANSAS

Champagnolle	3,205
El Dorado	2,100
Lisbon	295
Miller County	1,020
Nevada	870
Smackover Light	2,150
Smackover Heavy	17,790
Stephens	560
Urbana	1,935
Total	29,925

Texas side Rodessa field, 2,315 bbls. daily.

New Operations

Last week's new operations in North Louisiana, South Arkansas and the Rodessa portion of Cass County, northeast Texas, follow:

Caddo Parish

Kenwood Pool, Inc. No. 1 W. K. Henderson, 1,980 feet south and 200 feet east of the NW cor. section 5-19-15.

R. W. Norton (Magnolia) No. A-5 Caddo Levee Board, 2,600 feet south and 1,980 feet west of NE cor. section 21-23-16.

R. W. Norton (Magnolia) No. A-6 Caddo Levee Board, 2,600 feet north and 660 feet west of C section 28-23-16.

United Gas Public Service Co. No. 4 Brewer Unit, 659 feet south and

NATIONAL OIL SCOUTS CONVENTION

Scouts who recently met in Dallas, Tex., to make arrangements for the National Oil Scouts Convention to be held in that city from May 29-31.

Back row, left to right: Joe Haygood, Humble Pipe Line Co., Midland, Tex.; Jess Bullard, scout for Shell Petroleum Corp., San Antonio, Tex., president of the association; John Langston, chief scout, Sun Oil Co., Dallas, Tex., past president; Howard Boyd, secretary-treasurer.

Middle row: Paul Martin, chief scout, Pure Oil Co., Fort Worth, Tex., past president; Wm. Atcheson, Houston, Tex.; Dwight Becker, chairman of executive committee and scout for Amerada Petroleum Corp., Houston, Tex.; S. A. Germany, scout for Shell Petroleum Corp., Tyler, Tex.; Ira Jared, scout, Sun Oil Co., Shreveport, La.

Bottom row: Ferd Davis, Amerada Petroleum Corp., Corpus Christi, Tex., and Lee Adams, scout for Sinclair Prairie Oil Co., Shawnee, Okla.

660 feet west of NE cor. of a 55-acre tract in section 29-23-16.

United No. 1-574 fee, 660 feet north and west SE cor. section 16-23-16.

United No. 3 Harris, 232 feet south and 330 feet west NE cor. section 15-23-16.

United No. 4 Miller, 232 feet south and 330 feet east NW cor. section 14-23-16.

United No. 2 Mitchell, 656 feet lease in section 20-23-16.

United No. 7 M. L. Pitts, 330 feet south and 50 feet west NE cor. SW SW section 13-23-16.

United No. 8 M. L. Pitts, 307 feet north and 330 feet east, SW cor. of east 28 acres, NE NW section 15-23-16.

United No. 3 N. S. Spearman, 658 feet north and 650 feet east of SW cor. SE NW section 18-23-15.

De Soto Parish

E. A. Stiller No. 1 Jenkins, NE NW NE section 35-13-12.

Cass County, Texas

United No. 1 L. J. Cunningham, 330 feet north and 697 feet west, SE cor. of a 220-acre lease in the W. Robinson Survey.

LaSalle Parish

H. T. Taylor No. 7 fee, SW SW SE section 19-10-2e. Now testing at 1,580 feet in shallow sand.

Red River Parish

Byrd Exploration Co. No. 1 Waller, 1,570 feet north and 1,520 feet west of the SE cor. section 20-13-11, location.

T. G. Shaw and others No. 1 Teekell, C SE SE SW section 34-13-10, location.

Bradley County

Phillips Petroleum Co. No. 1 C. H. Murphy and others, NW cor. NW NW section 12-17-11.

Miller County

King Oil Corp. No. 1 Mann, C NW NE SE section 2-16-26.

Ouachita County

Lion Oil Refining Co. No. 1 Reynolds and Berg, C E half SE NE section 28-15-15.

Phillips Petroleum Co. No. 1 Murphy, C E half NE NE section 28-15-15.

Completed Wells

Completions registered last week in the same district, listed by parishes and counties, follow:

LOUISIANA

Caddo Parish

Arkansas-Louisiana Gas Co. No. 9 Rodessa Oil & Land Co., SW cor. SE NE section 22-23-16, flowed 160 bbls. per hour through 1¼-inch tubing choke from total depth of 6,018 feet. Top of saturation was logged at 5,978 feet and 7-inch casing was cemented at 5,989 feet.

Juan and others No. 1 Hobbs, NE cor. NE section 28-21-15, was completed pumping 15 bbls. of oil per day from total depth of 1,669 feet.

Phillips Petroleum Co. No. 2 Rodessa Oil & Land Co., section 13-23-16, gauged 217 bbls. of oil per day through three-sixteenths inch tubing choke on completion at 6,001 feet. Top of saturation was 5,964 feet.

Standard Oil Co. of Louisiana (formerly Haynes) No. 13 Lawton, section 14-23-16, gauged 153 bbls. of oil per hour through 1¾-inch tubing choke at total depth of 6,029 feet. Top of saturation was picked up at 5,999 feet and 7-inch casing was cemented at 6,009 feet.

United Gas Public Service Co. No. 7 Ardis & Co., section 14-23-16, flowed 42 bbls. of oil per hour on completion gauge at total depth of 6,041 feet. Top of saturation was picked up at 5,990 feet and 7-inch casing was cemented at 6,019 feet.

United No. 13 Rodessa Oil & Land Co., section 22-23-16, gauged 37 bbls. of oil per hour through one-half inch tubing choke when completed at 6,011 feet. The well's first saturation was at 5,965 feet and 7-inch casing was cemented at 5,993 feet.

United No. 14 Rodessa Oil & Land Co., section 22-23-16, flowed 50 bbls. of oil per hour through one-half inch tubing choke when completed at 6,014 feet. Top of saturation was 5,968 feet and 7-inch casing was cemented at 5,980 feet.

United No. 2 N. S. Spearman Unit, section 18-23-15, gauged 24 bbls. per hour from total depth of 6,030 feet. Seven-inch casing was cemented at 6,013 feet and top of saturation was at 5,983 feet.

United No. 1 U. S. Government, in section 29-23-16, flowed 100 bbls. of oil per hour through one-half inch tubing choke at total depth of 6,045 feet. Top of saturation was determined at 6,022 feet and 7-inch casing was cemented at 6,020 feet.

DeSoto Parish

Larkin & Waar No. 1 Jackson, in section 1-11-14, encountered salt water and was abandoned in lime at 5,504 feet. It had base of last anhydrite stringer at 5,104 feet and elevation of 329 feet.

Sabine Parish

Windsor Oil Co. No. 1 Cassell, section 30-9-13, flowed 200 bbls. per day from shallow pay drilled to 1,752 feet. The well was cased with 6⅝-inch pipe to 1,635 feet.

Morehouse Parish

United No. 36 Grossett, section 15-21-4e, gauged 10,000,000 feet of dry gas per day at total depth of 2,251 feet with 6⅝-inch casing cemented at 2,095 feet.

United No. 38 Grossett, section 27-21-4e, produced 7,000,000 feet of dry gas on completion at 2,179 feet with 6⅝-inch casing cemented at 2,061 feet.

United No. 20 Tensas, section 9-21-4e, gauged 5,000,000 feet of dry gas per day at 2,182 feet, total depth, and with 6⅝-inch pipe cemented at 2,065 feet.

Union Parish

Southern Carbon Co. No. 68 fee, section 8-21-4e, gauged 10,000,000 feet of dry gas at completion depth of 2,160 feet. Six-inch pipe was cemented at 2,098 feet. Rock pressure was 948 pounds.

Lafayette County

Trans Petroleum Co. No. 1 Cockran, section 26-19-25, was abandoned as dry at 3,675 feet.

Ouachita County, Arkansas

Phillips Petroleum Co. No. 1 J. D. Reynolds, C SE SE NW section 27-15-15, flowed 208 bbls. of 54 gravity distillate and 13,290,000 feet of gas per day through a 4-inch flow line in 24-hour completion gauge. The well registered 1,450 pounds pressure on casing and 250 pounds on tubing with bottom-hole pressure of 2,255 pounds. It is completed at 4,926 feet in lime topped at 4,908 feet, generally referred to as Permian, but not positively identified as such so far.

Union County, Arkansas

Bouharal Oil Corp. No. 1 R. Humphrey, section 11-17-14, is abandoned dry at 3,267 feet. A showing of oil developed on drill stem test from 3,199 to 3,205 feet was of noncommercial proportions.

Drilling Contractors

(Continued from Page 261)

from the Texas Co. to drill No. 1 Woodhouse. In the meantime progress is being made on seven wells located as follows: One in Southwest Texas for the Bay Oil Corp., one at East Texas for Tide Water Oil Co., one at Jennings for Shell Petroleum Corp., two at South Houston for themselves and Stanolind Oil & Gas Co. and one at St. Martinsville for the Continental Oil Co. In the same field Tide Water Oil Co. No. 2 Smedes was completed for a large gas well, showing some distillate.

Trinity Drillers, Inc., of San Antonio, are operating rigs in six counties of Southwest and Gulf Coast Texas. In Wharton and Victoria Counties, wells being drilled for Rowan & Hope and Texas Co., respectively, are approaching critical depths. In the Laredo district the S.R.C. Oil Co. No. 17-A Trevino in Escobas field is on the sand, as is the Superior Oil Co. No. 8-A Billings in Lopez. Whipstock is being set in the Feltner No. 1 Carter, Live Oak County wildcat to drill deeper in a sidetracked hole. A Trinity crew has just spudded Continental Oil Co. No. 9-A Sevier in the Driscoll field of Duval County.

Al Buchanan of San Antonio is operating all but one of his 15 rigs in proven fields of Southwest Texas. The exception is drilling for Benedum & Trees Oil Co. on the Welder ranch of San Patricio County. The test which has showed oil at two levels, but which has failed as yet to make a producer, is being whipstocked at 5,815 feet to drill back to the 6,100-foot sand where saturation was cored. Rigs are drilling in the Plymouth field of San Patricio County and the Loma Novia, Labbe, Piedra Lumbre and Seven Sisters fields of Duval County for a number of major operators.

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California Field Report

By
L. P. STOCKMAN

EL SEGUNDO PROVES AN OIL FIELD WITH A 450-BBL. WELL

LOS ANGELES, Calif., May 11.—The Republic Petroleum Co. definitely removed any doubts that might have existed as to the presence of an oil field in the El Segundo district of Los Angeles Basin by completing its No. 2 El Segundo flowing 450 bbls. of 27.5 gravity oil and 500,000 feet of gas per day. The Republic's new producer, located in section 18-3-14, was bottomed at 4,477 feet and brought in barefoot. Production is cutting approximately 9 per cent, but the company's field department is of the opinion that this water problem can be overcome by running in a 5¾-inch liner and effecting a squeeze job around the top of the liner and a few feet below the shoe of the 7-inch water string, which was landed and cemented at 7,355 feet. A theoretical test has indicated that each 1,000 feet of gas contains approximately 4 gallons of natural gasoline. Due to the saturated condition of the gas, the Republic Petroleum Co. will install a portable casinghead plant in the immediate future. Based on an output of 700,000 feet of gas per day, 200,000 feet coming from No. 1 and 500,000 feet from No. 2, and with natural gasoline commanding a price of approximately 6 cents per gallon, the company's income would be increased $168 per day from the natural gasoline plant only. At the current price of $1.03 per barrel for crude oil, the company's income has been increased approximately $550 per day during the past week.

The Ohio Oil Co. has staked a tentative location for No. 1 Gough in section 7-3-14. Operators holding acreage in the El Segundo field are not any too anxious to undertake immediate drilling as the field is still an enigma and might easily lead to the drilling of several dry holes as correlation work between the Republic's two producing wells in this area has furnished little evidence as to the trend of the structure and outer limits of production. Two companies contributed dry hole money to the Republic Petroleum Co. and it might be possible that a similar procedure will be followed in the drilling of the next test in this field. Drilling costs approximate $80,000 per well and, in view of the relatively small production secured by the Republic Petroleum Co., operators are rather reluctant to undertake the risk involved for such a small return. The potentiality and productivity of the El Segundo field is problematical and it is quite possible that the Republic's lease is located rather far out on the edge of a large structure. The Ohio, Universal Consolidated and the Texas Co. have acreage located immediately adjacent to the Republic Petroleum Co.'s lease.

Montebello

In the eastern extension of the Montebello field Universal Consolidated Oil Co. made a formation test on No. 1 Pasadena in this field and with the tester open 30 minutes recovered nine stands of 38 gravity oil and one stand of drilling mud with no free water in evidence. The well flowed gas for 35 minutes after closing the valve on the tester and if the Schlumberger test checks out, the company will cement casing at approximately 5,400 feet.

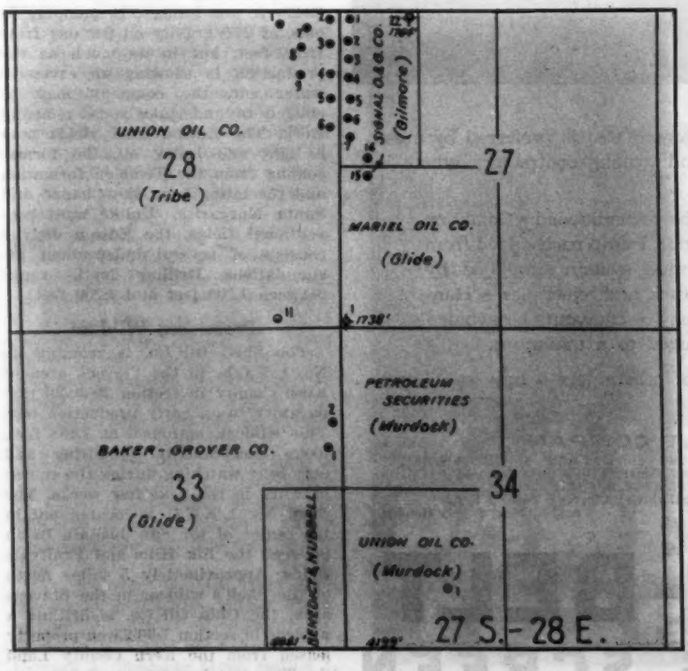
The Texas Co. completed No. 13 Baldwin in the Montebello extension a few days ago at 6,980 feet after being plugged back from 7,312 feet and finished with a 6⅝-inch liner including 75 feet of perforated. It was brought in flowing 395 bbls. of 37.1 gravity oil and 3,800,000 feet of gas per day. Womac, Inc., completed No. 1 in the Montebello extension pumping 148 bbls. of 29.1 gravity oil per day from 3,164 feet after the hole had been finished with an 8⅝-inch water string landed at 2,952 feet and a 6⅝-inch liner carrying 212 feet of perforated. Production of the Womac well shows a cut varying from 1 to 10 per cent emulsion. No. 1 Glass of the North American Oil Corp. in section 5-2-11 is coring ahead in a shale streaked with oil sand and this well may be given an early production test. The first showings were encountered in this well at approximately 5,400 feet and the well log shows that the top of the Miocene was picked up at 4,220 feet. The Universal Consolidated recompleted No. 1 Farmer in the Montebello extension after plugging back from 7,435 feet to 6,440 feet and returned it to production flowing 127 bbls. per day.

TANKER SHIPMENTS FROM LOS ANGELES TO DOMESTIC AND FOREIGN PORTS

	April 26		April 19			
	Total this week	Daily average	Total last week	Daily average	This year to date	Same time last year
Intercoastal-domestic:						
Diesel and gas oil	.....	.....	.....	.....	151,541	527,098
Gasoline	300,285	42,898	180,767	25,824	2,131,171	2,427,467
Kerosene	.....	.....	40,423	5,775	505,419	592,040
Foreign exports:						
Crude oil	163,779	23,397	179,118	25,588	3,060,780	3,474,732
Fuel oil	328,001	46,857	287,816	41,117	3,335,428	3,897,350
Diesel and gas oil	135,674	19,382	222,723	31,818	1,623,683	1,299,309
Gasoline	19,191	2,742	310,417	44,345	1,954,787	1,488,900
Kerosene	71,553	10,222	143,726	20,532	380,593	331,731
Other unfinished oil	.....	.....	6,936	991	13,375	53,205
Coastwise-domestic:						
Crude oil	216,216	30,889	294,129	42,018	2,269,151	1,892,482
Fuel oil	193,707	27,672	176,306	25,187	2,950,318	2,699,003
Diesel and gas oil	42,299	6,043	6,594	942	490,559	302,272
Gasoline	377,210	53,887	228,477	32,640	4,422,111	2,631,511
Kerosene	2,209	316	.....	.....	81,795	42,757

TANKER SHIPMENTS FROM SAN FRANCISCO TO DOMESTIC AND FOREIGN PORTS

Intercoastal-domestic:						
Diesel and gas oil	.....	.....	.....	.....	.....	157,258
Gasoline	71,560	10,280	.....	.....	71,900	.....
Kerosene	.....	.....	.....	.....	.....	149,715
Asphalt	.....	.....	60,950	8,707	60,950	71,325
Lubricants	.....	.....	10,521	1,503	18,129	12,381
Foreign exports:						
Crude oil	.....	.....	317,092	45,299	946,001	550,129
Fuel oil	48,512	6,930	46,001	5,714	1,198,294	546,807
Diesel and gas oil	57,032	8,147	86,094	12,299	287,819	351,784
Gasoline	.....	.....	21,466	3,066	987,773	782,760
Kerosene	.....	.....	79,713	11,388	243,420	216,282
Lubricants	.....	.....	16,799	2,400	90,587	74,411
Coastwise-domestic:						
Fuel oil	112,184	16,026	252,865	36,124	2,495,263	2,087,191
Diesel and gas oil	.....	.....	.....	.....	179,703	79,662
Gasoline	126,129	18,018	29,736	4,248	1,536,994	1,282,360
Kerosene	.....	.....	.....	.....	55,772	18,109



South end of Mount Poso field where outposts indicate extension

Lost Hills-Belridge

The Belridge Oil Co., discoverer of deep production in the North Belridge field of Kern County, completed an exceptionally good well when No. 6-1 in section 1-28-20 was brought in flowing 1,850 bbls. of clean 42.6 gravity oil and 46,410,000 feet of gas per day. The new well shows a pressure of 2,400 pounds on the tubing and 2,760 pounds on the casing. It is flowing through a 52/64-inch bean and on a two-hour potential test it flowed at the rate of 3,670 bbls. per day. The Belridge Oil Co.'s new producer was bottomed in the Wagou Wheel zone and was finished with 387 feet of 4¾-inch liner including 361 feet of perforated landed at 8,428 feet and a 4¾-inch flow string hung at 8,040 feet. Bottom of the hole is at 8,435 feet and the water shutoff was effected with a string of 7-inch casing landed and cemented at 8,090 feet. Barring the development of mechanical trouble, the Continental Oil Co. should finish the next well in the North Belridge field, as No. 7 Result is within 600 feet of completion. This well should be followed into production within a short time by the Standard Oil Co. No. 4 McPhail, Belridge Oil Co. No. 17-35 and the Union Oil Co. No. 20 Belridge.

Kettleman Hills

The Kettleman North Dome Association (Kenda) No. 72-30-J was brought in flowing 3,496 bbls. of clean 34.3 gravity oil and 4,611,000 feet of gas per day. Kenda's new producer was bottomed at 8,479 feet and finished with a 6⅝-inch water string landed at 8,244 feet and a 4¾-inch liner carrying perforations at 8,271-8,346 feet and at 8,389-8,495 feet. Kenda and Standard still have 10 incompleted drilling wells in the North Dome field which should be tanking oil within another 30 days. In the Middle Dome of Kettleman Hills, the

Standard Oil Co. No. 38-29-V, in section 29-23-19, is rotating ahead in a barren gray sand at 8,800 feet. This well failed to result in commercial production on a test made several months ago and the company accordingly resumed drilling operations in order to make a deep conclusive test. In section 19-23-19, the Standard has staked location for No. 46-19-V and drilling operations are expected to get under way within another 30 days. Three producing wells have been completed in the Kettleman Middle dome up to the present time, the Standard having completed one well in section 29-23-19 and the Petroleum Securities having completed two commercial producers in section 19-23-19.

Torrance-Redondo

Another new well was finished this week in the Redondo section of the Torrance field of Los Angeles Basin and two more potential producers should be ready for production tests within another 10 days. George K. Linderman Corp. No. 1 Redondo was completed May 6 pumping 340 bbls. of 17.9 gravity oil per day from 3,751 feet. The water string in this well was 8⅝-inch casing landed and cemented at 3,213 feet and the hole was finished with a 6⅝-inch liner carrying 527 feet of perforated. The hole was acidized before being placed on the beam.

In the Hermosa section of the Redondo area, which more specifically can be described as that section lying west of Redondo in the extreme western end of the Torrance field, the B. & N. Oil Co. completed No. 1 H. R. L. pumping 292 bbls. of 18.1 gravity oil per day from 3,368 feet after the hole had been finished with a 6⅝-inch liner carrying 339 feet of perforated. The output is cutting 9 per cent but may clean up a little after the well has been on production for several days and had a chance to clean itself out. In the Wilmington district of Los Angeles Basin, where operators have completed several small wells within the past six months, the Codri Oil Co. placed its No. 1 on the beam following the completion of drilling operations at 3,568 feet and while an accurate gauge is not available, the well looks good for approximately 100 bbls. per day. The Eyer Petroleum Co. No. 1 in the Wilmington district completed a few weeks ago was taken off the beam early this week in order to permit the crew to undertake some remedial work. Water broke in on this well and another cement job or a reinforced plug in the bottom of the hole will be necessary. The Sovereign Oil Co. has cemented its No. 1 Banning in the Wilmington district after plugging back the hole from 3,063 feet to 3,535 feet. W. E. Deuel is building a rig for a new well to be drilled in the vicinity of Playa Del Rey and the progress of work on this well will be watched with considerable interest as this wildcat is located near the Westport Petroleum Corp. No. 1 which was drilled at 5,960 feet and blew out in May, 1931, flowing approximately 10,000,000 feet of dry gas per day.

Mountain View

The Ohio Oil Co. finished an excellent producer in the Mountain View field of Kern County when No. 4 Derby was brought in flowing 1,910 bbls. of relatively clean 28.1 gravity oil and 1,000,000 feet of gas per day from 5,860 feet. This new well has an 8⅝-inch water string landed and cemented at 5,087 feet and was finished with a 6⅝-inch liner including perforations at 5,083-5,364 feet and at 5,553-5,851 feet. Although drilling operations in the Mountain View field have been showing a declining tendency during the past several weeks, a check of development work under way indicates the probable completion of three new wells within the next 15 days. The Petrol Corp. has acquired 2½ acres of the Foster Community property, which was withheld for the purpose of drilling water wells and the company has started rig construction for its No. 1, located in section 32-30-29.

One new well was completed in the Edison field of Kern County during the period of this report and two more potential producers are scheduled for completion within the next 10 days. The new well completed this week was No. 9 Knapp of the General Petroleum Corp. in section 24-30-29. It was brought in pumping 54 bbls. of 24.8 gravity oil per day from 1,458 feet, but in as much as the production is showing an excessive water cut, the company may be obliged to undertake some remedial work. The Edison field yields both a light and heavy oil, the former coming from the Temblor formation and the latter from the Chanac and Santa Margarita. Unlike most conventional fields, the Edison district consists of several independent accumulations. Drilling depths range between 1,200 feet and 4,250 feet.

Promising Wildcat

The Shell Oil Co. is reaming its No. 1 K.C.L. in the Stevens area of Kern County in section 29-30-26 preparatory to an early production test. This wildcat, bottomed at 7,888 feet, looks exceptionally promising and may bear watching during the course of work in the next few weeks. The Shell No. 1 K.C.L. is located out in the center of the San Joaquin Basin between the Elk Hills and Fruitvale fields. Approximately 5 miles north of the Shell's wildcat in the Stevens area, the Ohio Oil Co. is drilling a wildcat in section 1-30-25 on property leased from the Kern County Land Co. This test has not yet shown any promising indications, but another 500 feet of hole may change the aspect of the situation. The Ohio's wildcat is approximately 400 feet shallower than the Shell's test in the Stevens area and, consequently, the former's well is approaching the critical depth. Two new wildcats of outstanding importance are scheduled to get under way within the next 60 days and both tests will be watched with interest. The Seaboard Oil Corp. is seriously contemplating drilling a wildcat on the Ciervo anticline in the southeastern part of San Benito County. This test will be drilled to determine the possibility of developing commercial gas production in the Cretaceous section. The Hogan Petroleum Co., first operator to develop commercial production in the Mountain View field of Kern County, has acquired several hundred acres in the Jacalitos district of Fresno County and the company's first test will be drilled on this acreage about 5 miles south of Coalinga.

The Vanguard Oil Co. has completed its fourth commercial producer on the Baker property in the Mount Poso field of Kern County and this new well, located in section 33-27-28, was brought in pumping 531 bbls. of relatively clean 18.2 gravity oil initially. No. 4 Baker was bottomed at 1,788 feet and finished with an 8⅝-inch water string landed at 1,712 feet and a 6⅝-inch liner carrying 71 feet of perforated. The Santa Carla Oil Co. encountered gray sand in its No. 1 Poso and is abandoning work at 2,008 feet. The top of the Vedder zone was picked up in this well at 1,967 feet but it was found to be barren. The Union Oil Co. is drilling an interesting outpost on the Murdock property in the southern part of the Mount Poso field and if commercial production is developed the company will have a number of additional locations available for drilling operations on the Murdock lease in section 34-27-28 and on the Tribe property in section 28-27-28.

Round Mountain

The Honolulu Oil Corp. added another well to its list of producers in the Round Mountain field of Kern County this week when No. 77 in section 18-28-29 was brought in pumping 308 bbls. of 17.4 gravity oil initially from 2,100 feet. No. 67 in the same section is scheduled for completion within the next several days as the water string has just been run in and cemented. Due to the relatively shallow depth at which production is developed in the Round Mountain field, operators complete the wells from spud to completion in approximately 15 days. The Shell Oil Co. has two potential producers nearing completion on the Caldwell property in section 7-28-29 and both should be tanking oil within the next 24 hours. The Shell is not losing any time with its development program on the Caldwell property, as the company is rigging up Nos. 6, 11 and 12 and has new rigs in course of construction for Nos. 7, 8 and 9. This aggressive development will probably result in the drilling of additional wells by the Barnsdall Oil Co. in the near future. The Magnet Oil Co. completed its No. 1 Anderson in the Fruitvale field of Kern County early in the week and this new well was brought in pumping 141 bbls. of 22.3 gravity oil per day from 4,069 feet. The Nydia Petroleum Co. has acquired 10 acres of the Ticehursts property in the southeastern end of

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the Fruitvale field and has staked location for its initial test, which will be drilled in the NW cor. section 26-29-27. The Mountain Oil Co. has just finished a new rig for No. 1 Gribble in section 21-29-27 and rotary drilling equipment will be moved in within the next few days.

No completions were chalked up in the West Front section of the Kern River field during the past week, but three potential producers are scheduled to be completed within the next few days. These wells are the Chanslor Canfield Midway Oil Co. No. 60 in section 23-28-27, Republic Petroleum Co. No. 8 Strassburger and the Lloyd Oil Co. No. 1 Tavis in section 3-28-27. The Kern River Oilfields is building a new rig for No. 2-B, a new well which will be drilled in section 25-28-27, and spud is expected to be made May 20. The Republic Petroleum Co. is completing preparations to drill another well on the Fleishacker lease in section 11-28-27 and will also drill an additional well on the Strassburger property. The Midway-Sunset field of Kern County has shown a phenomenal increase in drilling operations during the past several weeks and, in keeping with the rate of increase registered during the past month, several additional locations were staked during the current week. A considerable part of this new drilling reflects the completion of a series of new wells which have shown substantial production. Most of these wells are completed from depths ranging between 3,000 and 3,500 feet at a cost of approximatly $60,000 and it does not take a 1,000-bbl. well very long to pay out on the basis of $1 per barrel for crude oil.

Dominguez

The Union Oil Co. completed No. 45 Callender in the Dominguez field of Los Angeles Basin flowing 921 bbls. of clean 30.1 gravity oil per day. No. 45 Callender was finished in the Miocene at 6,902 feet and has an 8⅝-inch water string landed and cemented at 6,383 feet. The Shell Oil Co. is making preparations to spud in No. 81 Reyes and has staked locations for Nos. 84 and 85. This trio of wells are scheduled to be completed in rocks of Miocene age. The Republic Petroleum Co. has made a tentative location for a new well to be drilled 1,400 feet north and 200 feet west of center line of Rosecrans avenue and Figueroa Street on 115 acres recently acquired in this district. This location places the Republic's new well in the Athens-Rosecrans field of Los Angeles Basin. The Standard Oil Co. completed an excellent well in the West Coyote field of Los Angeles Basin early this week when No. 61 Emery was brought in on a compressor doing 820 bbls. of 24.9 gravity oil per day from 5,715 feet. The Standard's next completion in this field will be No. 125 Murphy-Coyote, which was recently cemented on top of the pay. In the Long Beach field, the Italo Petroleum Corp. recompleted its No. 4 Signal pumping 218 bbls. of 24.2 gravity oil per day after cleaning out the hole to bottom, 4,781 feet and landing a 5-inch liner including 725 feet of perforated. The Shell Oil Co. No. 5 Coseboom was recompleted pumping 118 bbls. of 27.2 gravity oil per day after a reconditioning job.

In the Edna district of San Luis Obispo County, the Pismo Petroleum Corp. completed No. 1 Scott, pumping 210 bbls. of 22.1 gravity oil per day from 2,942 feet after the hole had been finished with a 6⅝-inch liner including 67 feet of perforated. J. D. Martin focused the attention of operators on this area several months ago by completing two wells good for approximately 75 bbls. per day each. This operator is at the present time drilling ahead on No. 4-A at 2,215 feet and is making hole in No. 1-C at 1,960 feet. This drilling is being done with cable tools and in the first well 10-inch casing is being carried and 8⅝-inch in the latter well. The A. T. Jergins Trust has entered this district and is building a new rig on the Lowther property in section 5-32-13. The Bankline Oil Co., which has taken over the Bolsa Chica Oil Co.'s wildcat in the Coal Oil Point district of Santa Barbara County, has plugged back the hole to 469 feet in order to facilitate redrilling operations. The Bankline started this redrilling job a week or two ago and got down to 629 feet, but the whipstocked hole failed to adhere to its directed course and wound up in the original hole drilled by Bolsa Chica.

Central West

Operations in Central Ohio, Kentucky, Illinois, Indiana

By GEORGE A. WHITNEY

FINDLAY, Ohio, May 11. — The Central West fields are holding their own as far as completions are concerned, especially in the Central Ohio field.

In Perry County, the Caywood Mid-East Gas Co. No. 2 on the Homer Caywood, section 11, Reading Township, was a dry hole. In Thorn Township, Hopewell Gas & Fuel Co. No. 1 Dora J. Lonas, section 36, is a gas well at a depth of 2,834 feet. In Madison Township, Mid-East Gas Co. No. 1 John R. Melick, section 31, is a dry hole at 3,180 feet. Kachelmacher No. 13 Hemlock Coal Co., section 30, Monroe Township, produced an initial of 24 bbls.

In Starke County, Ohio Fuel Gas Co. No. 4 Eliza Harmont, section 27, Jackson Township, is a gas well at 4,382 feet, and Ohio Fuel Gas Co. No. 1 Cuba A. Buchtel, section 4, is a gas well at 4,280 feet. East Ohio Gas Co. No. 1 Amanda Smith, section 27, same township, is a gas well at 4,322 feet. Same company is drilling No. 3 on the B. and L. Albright farm, section 9. In Sugar Creek Township, Ohio Fuel Gas Co. has a location staked for a test on the Joseph Forney farm, section 21.

In Ashland County, Ohio Fuel Gas Co. No. 1 A. J. Talbot, section 18, Jackson Township, produced 26 bbls. initially, at 2,623 feet. Same company is drilling No. 3 A. J. Stoner, section 3, same township. In Mohican Township, Falkner & Phelps No. 8 on the Guy Z. Hamm farm, section 8, is drilling.

In Holmes County, the Ohio Fuel Gas Co. No. 1 Phillip Mizer, section 26, Paint Township, is a gas well at 4,032 feet. Same company made location for a test on the Moses S. Miller farm, section 29, same township, and was drilling No. 1 Hannah Tidball, section 19; has a rig up for a test on Thomas L. Hughes farm, section 34, Ripley Township, and is drilling No. 1 W. Craig, section 9, Mechanic Township.

In Summitt County, East Ohio Gas Co. No. 1 Rose Lamb, section 17, Greene Township, is a gas well at 4,029 feet. Same company is drilling No. 1 on the M. Krasinski farm, section 19, same township; drilling No. 1 John Kauffman, section 36, Franklin Township, and has a rig in for No. 1 on the I. Mathiia farm, in section 36.

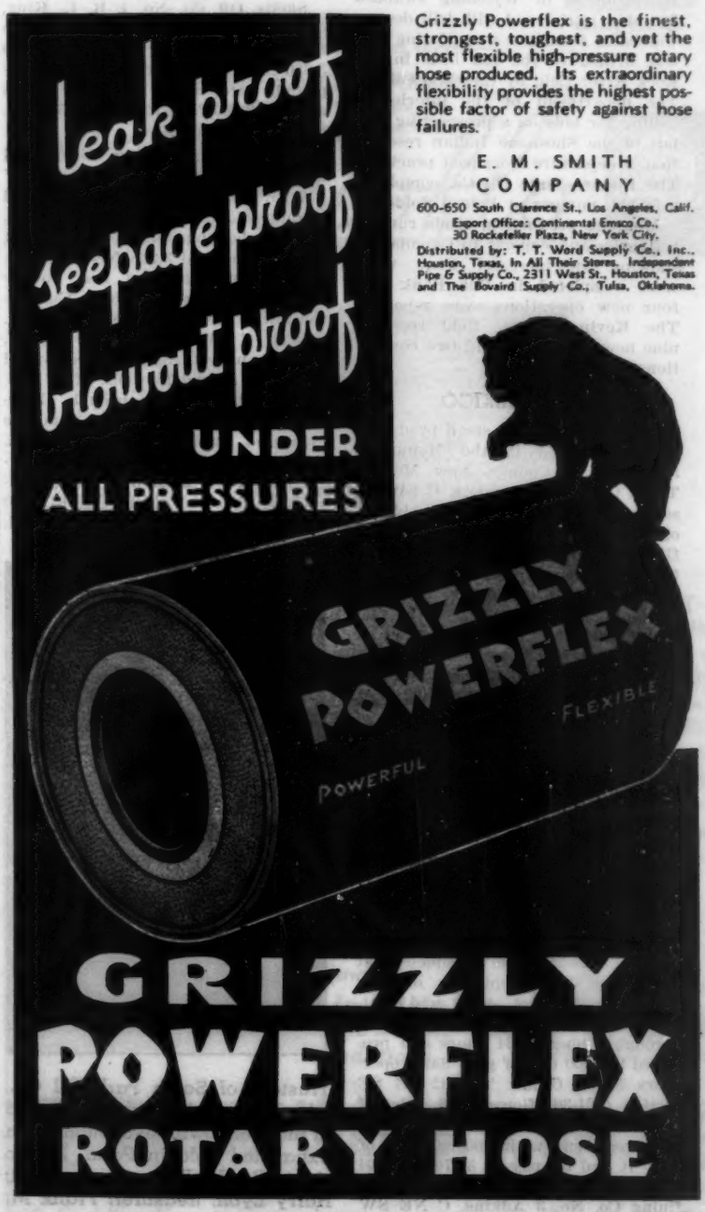
In Coshocton County, M. C. Waltz No. 11 Jess Lawrence, section 4, Clark Township, produced 3 bbls. initially at a depth of 810 feet. Hulse & Kuntz, Inc., is drilling No. 3 Charles Lawson, section 17, Perry Township, same county.

In Logan County, Jack Center Oil & Gas Co. is drilling No. 1 Vera Haradon, section 6, Stokes Township.

In Huron County, J. E. Ringler is drilling No. 1 F. and A. Verburg, Lot 40, Fitchville Township, and the Upham Gas Co. is drilling No. 1 Alonzo Spurgeon, Lot 19, Tiverton Township.

In Cuyahoga County, Ohio Fuel Gas Co. is drilling No. 1 John Stark, section 4, Dover Township, and Schneider & Wyles are drilling No. 1 Howard L. Simmons farm, section 1,

(Continued on Page 282)



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Rocky Mountain Area

NORTHERN FIELDS RESUMING ACTIVITY WITH SPRING HERE

By T. R. INGRAM

DENVER, Colo., May 11.—Development of the Powder Wash field in Moffat County, Colorado, where the Mountain Fuel Supply Co. brought in the discovery well in 1931 in the highest producing horizon in the geological column in the Rocky Mountain area, is to begin this spring. The Texas Co. completed a small Sundance sand well on the Moffat dome and the South Park Oil Co. discovery on the Hartsel anticline swabbed at the rate of 200 bbls. a day.

The Taylor semiwildcat on the Byron dome in Wyoming swabbed 300 bbls. initial and will drill deeper. The basal Sundance was missing in a test drilled to the red beds in the Rock River field by the Ohio Oil Co. The department of the interior is calling for bids on a prospecting permit in the Shoshone Indian reservation, a departure from past practices. The Empire State Oil Co. completed a 50-bbl. pumper at Poison Spider.

Montana production, crude runs to refineries and exports to Canada are showing an increase. Four wells were completed in Cut Bank and four new operations were reported. The Kevin-Sunburst field reported nine new operations and two completions.

NEW MEXICO

Two large and one small producers were completed in the Monument area of Lea County, New Mexico. Texas Co. No. 2 Saunders, C SW SE section 18-19-37, flowed 3,288 bbls. of oil natural through tubing in the first 24 hours after stopping at 4,000 feet, total depth. Oil pay was had at 3,877 feet to total depth. Shows of oil and gas were had at 2,778 feet and 3,500 feet. Packer was set at 3,870 feet. Shell Petroleum Corp. No. 2 State "D," C NE SE section 19-19-37, had oil pay at 3,920-4,002 feet, total depth, and flowed 3,744 bbls. of oil natural through tubing in the first 24 hours. Gas gauged 1,500,000 feet. Skelly Oil Co. No. 1 Christmas, C SW SW section 25-19-36, had oil pay at 3,837 to 3,942 feet, total depth. It was shot with 200 quarts at 3,837-3,942 feet and after acidizing with 4,000 gallons, it swabbed 110 bbls. of oil in 24 hours, completed.

In the Eunice district, Gulf Oil Corp. No. 1 Orcutt "B," C SW SE section 5-21-36, was completed at 3,805 feet, total depth, in oil pay topped at 3,765 feet. After acid treatment, it flowed 316 bbls. of oil through tubing in 24 hours and produced 995,000 feet of gas. Same operators No. 2 Orcutt "B," C SE SE section 5-21-36, flowed 510 bbls. of oil through tubing in 24 hours after acid treatment, with 1,000,000 feet of gas. It had oil pay at 3,770 to 3,864 feet, total depth. Humble Oil & Refining Co. No. 3 Adkins, C NE SW section 10-21-36, flowed 648 bbls. natural in the first 24 hours, with gas gauging 463,000 feet. It had oil pay at 3,850-3,880 feet, total depth. Continental Oil Co. No. 5-B-28 Lockhart, C NW NE section 28-21-36, was completed at 3,939 feet, total depth, in pay topped at 3,810 feet. After acidizing and shooting with 200 quarts at 3,809-3,911 feet, it flowed 300 bbls. of oil and 300 bbls. of water on gas lift. Shell Petroleum Corp. No. 1 State-Endura "D," C SE NW section 11-21-35, was abandoned at 4,212 feet, total depth, after drill stem test showed sulfur water.

Skelly Oil Co. No. 1 B. L. King, C SW SE section 32-22-37, in the Sims area, had oil pay at 3,632 to 3,680 feet, total depth, and was completed. After a shot with 230 quarts at 3,588-3,680 feet, it pumped 54 bbls. of oil in 24 hours.

In the Jal Sand sector, Liberty Oil & Drilling Co. No. 1 J. W. Hair, SW SW SE section 24-24-37, was dry and abandoned at 3,702 feet, total depth. It had showings of oil and gas at 3,020-40 feet and 3,268 feet.

Other miscellaneous Lea County completions were as follows: Culbertson-Irwin & Stovall No. 1 J. A. Stuart, C SW SE section 10-25-37, had oil pay at 3,280-94 feet, total depth. It flowed 137 bbls. of oil natural in two hours through three-quarters inch tubing choke. Gas was estimated at 4,000,000 feet. W. L. Todd and others No. 1 Lemon Permit, C NW SW section 17-21-32, wildcat, was dry and abandoned at 3,260 feet. No shows of oil were reported.

Trustees of South Park Oil Co., who brought in highest oil field in the world with exception of an exhausted field in Peru. Left to right: R. W. Kramer, president; Harry Lyon, treasurer; Frank M. Davis, secretary

In the Artesia area of Eddy County, Tignor, Etz & Keys No. 1 Keys "B," C SE SW section 3-17-28, produced 4,000,000 feet of gas and was completed. It had gas pay at 1,390 to 1,415 feet, total depth. Tex Patillo No. 2 Thomason, NE cor. section 1-20-28, an Eddy County wildcat, was dry and abandoned at 1,150 feet, total depth. It failed to find an oil or gas pay.

Monument Area

Continental Oil Co. No. 2-C-30 State, C NW SW sec. 30-19-37. T.D. 3,910 ft.; drill pipe stuck; whipstock at 3,833-3,871 ft.; waiting on 5½-in. csg.

Anderson & Prichard Oil Corp. No. 1 Britt "A," C SE SW sec. 6-20-37. T.D. 3,966 ft.; acidized; flowed 132 bbls. oil through 1-in. csg. choke, 4 per cent water; to set packer.

Gulf Oil Corp. No. 1 G. C. Mathews, C SW SE sec. 6-20-37. T.D. 3,884 ft. in lime; flowed 260 bbls. in 4 hrs.; setting packer at 3,773 ft.

Gulf Oil Corp. No. 1 A. B. Reeves, C NW SW sec. 29-20-37. Wildcat; T.D. 3,844 ft. in lime; set 5½-in. csg.

Gulf Oil Corp. No. 3 Graham-State "C," C SW NE sec. 24-20-36. Drlg. 3,600 ft.

Sun Oil Co. No. 5 Weir, C SW NE sec. 35-19-36. T.D. 3,940 ft.; acidized; testing.

Sun Oil Co. No. 6 Weir, C NW NE sec. 35-19-36. Loc.

Texas Co. No. 2 Mattern, C SW SW sec. 20-19-37. T.D. 3,500 ft. in lime; setting 6⅝-in. csg.

Amerada Pet. Corp. No. 1 State "P," C NW SW sec. 29-19-37. Drlg. 3,360 ft.

Amerada Pet. Corp. No. 1 State "R," C NE SW sec. 29-19-37. T.D. 2,525 ft.; set 8⅝-in. csg.

Amerada Pet. Corp. No. 2 State "O," C SW NE sec. 30-19-37. Drlg. 3,313 ft.

Texas Co. No. 2 Phillips, NE NE NW sec. 6-20-37. T.D. 3,800 ft.; set 7-in. csg.

Amerada Pet. Corp. No. 1 Weir "B," C SW NE sec. 26-19-36. T.D. 4,000 ft.; acidized; gauged 2,500,000 ft. gas; 1 bbl. oil per hour; rigging up standard tools to deepen.

Amerada Pet. Corp. No. 2 State "H," C NW SE sec. 1-20-36. Drlg. 3,587 ft.

Skelly Oil Co. No. 2 State "D," C NE SE sec. 1-20-36. Drlg. 3,460 ft.

Texas Co. No. 4 State "E," C NE SW sec. 1-20-36. T.D. 2,540 ft.; set 7-in. csg.

Tide Water Oil Co. No. 1 State "F," C NW NW sec. 20-19-37. Drlg. 3,750 ft.

Ohio Oil Co. No. 2 State-Elliott, C NE SE sec. 30-19-37. Drlg. 2,642 ft.

Continental Oil Co. No. 2-A-6 Britt, C NW SW sec. 6-20-37. Drlg. 3,271 ft.

Fred Turner, Jr. No. 1 State "A," NE NW SW sec. 2-20-36. Drlg. 2,635 ft.

Texas Co. No. 3 Phillips, C SW NW sec. 6-20-37. T.D. 1,655 ft.; set 9⅝-in. csg.

Anderson-Prichard Oil Corp. No. 3 Britt, SE SW NE sec. 7-20-37. Cellar and pits.

Sun Oil Co. No. 1 State, C NE NE sec. 25-19-36. T.D. 625 ft.; S.D. for water

Anderson-Prichard Oil Corp. No. 1 State, C SW NW sec. 2-20-36. Rigging up rotary.

Gulf Oil Corp. No. 2 Luthy, C NW NW sec. 29-19-37. Drlg. 3,275 ft.

Amerada Pet. Corp. No. 3 State "O," C SE NE sec. 30-19-37. T.D. 2,501 ft.; set 8⅝-in. csg.

Continental Oil Co. No. 4 State "C," C SW NW sec. 30-19-37. Cellar and pits.

Continental Oil Co. No. 3 State "C," C SE NW sec. 30-19-37. Drlg. 2,765 ft.

Amerada Pet. Corp. No. 1 Lambert, NW NW NE sec. 6-20-37. Drlg. 2,355 ft.

Amerada Pet. Corp. No. 1 State "S," C SE SW sec. 2-20-36. T.D. 2,380 ft.; set 8⅝-in. csg.

Gulf Oil Corp. No. 1 S. T. Burk, C NE NE sec. 28-19-37. Drlg. 1,450 ft.

Amerada Pet. Corp. No. 4 State "O," C NE NE sec. 30-19-37. T.D. 180 ft. in Red Rock.

Texas Co. No. 1 State "J," C NE SW sec. 24-19-36. T.D. 280 ft.; set 13-in. csg.

Amerada Pet. Corp. No. 1 State "T," C SE SW sec. 25-19-36. Cellar and pits.

Shell Pet. Corp. No. 1 J. A. Foster, C SE SE sec. 24-19-36. Drlg. 500 ft.

Amerada Pet. Corp. No. 3 Phillips, C SW NE sec. 1-20-36. Rig.

Amerada Pet. Corp. No. 2 State "D," C SE NW sec. 1-20-36. Rig.

Gulf Oil Corp. No. 4 Graham-State "C," C SW SE sec. 24-19-36. Rigging up rotary.

Gulf Oil Corp. No. 1 J. W. Smith, C SE NE sec. 24-19-33. T.D. 278 ft.; set 10¾-in. csg.

Barnsdall Oil Co. No. 5 Cooper, C NE SE sec. 12-20-36. Drlg. 300 ft.

Gulf Oil Corp. No. 7 Culp, C NE NE sec. 19-19-37. Bldg. rig.

Gulf Oil Corp. No. 1 D. A. Williams, C NW SE sec. 29-19-37. Bldg. rig.

Empire Oil & Ref. Co. No. 2 State "E," SE SE SW sec. 30-19-37. T.D. 265 ft.; set 12½-in. csg.

Ohio Oil Co. No. 3 State-Elliott, SW SW SE sec. 30-19-37. Cellar and pits.

Anderson-Prichard Oil Corp. No. 2 Britt "A," C NE SW sec. 6-20-37. Location.

Amerada Pet. Corp. No. 2 Phillips, C SE NE sec. 1-20-36. Drlg. 3,540 ft.

Skelly Oil Co. No. 1 State "E," C SE NE sec. 29-19-37. Location.

Empire Oil & Ref. Co. No. 3 State "E," C NW SW sec. 30-19-37. Cellar and pits.

Continental Oil Co. No. 2-A-3 Reed, C SE NE sec. 3-20-36. Location.

Eunice Area

Gulf Oil Corp. No. 8 Bell-Ramsey-State, C NW NW sec. 4-21-36. T.D. 3,870 ft., fishing for drill pipe.

Gulf Oil Corp. No. 5 Arnott-Ramsey "C", C SE SW sec. 21-21-36. T.D. 3,890 ft.; testing.

Gulf Oil Corp. No. 66 Arnott-Ramsey "C," C NE NW sec 21-21-36. T.D. 3,570 ft.; whipstock at 3,031 ft.; drlg. by at 3,060 ft. Shut down for repairs.

Empire G. & F. Co. No. 2 Felton, C SE NW sec. 28-21-36. T.D. 3,990 ft. Acidized, no results; drlg. by half-joint drill pipe at 3,970 ft.

Empire G. & F. Co. No. 4 State "D", C SE NE sec. 32-21-36, five-eighths mile N part of No. 157 lease. T.D. 3,941 ft.; acidized, waiting.

Gulf Oil Corp. No. 2 Janda "B," C NE SE sec. 32-21-36. T.D. 3,880 ft. in lime; swabbed dry after acid; swabbing.

Gulf Oil Corp. No. 1 Arnott-Ramsey "D," C NW NW sec. 32-21-36. T.D. 3,885 ft. Acidizing, no help; reacidized, no help; to use gas lift.

Shell Pet. Corp. No. 1 State "H," C SE SE sec. 13-21-36. T.D. 3,954 ft.; plugged back. Set packer at 3,406 ft., flowed 490 bbls. in 15 hours, 30 per cent b.s. and water. Testing.

Continental Oil Co. No. 6-A-17 Meyer, C NW SW sec. 17-21-36. T.D. 3,875 ft. Set 5½-in. csg.

Continental Oil Co. No. 5-A-18 Meyer, C SE NE sec. 18-21-36. Drlg. 3,415 ft.

Jim Murray No. 2 Wallace, C NW NW sec. 3-21-36. T.D. 3,830 ft. Acidized; flowed 8 bbls. per hour; testing.

Continental Oil Co. No. 1-B-14 Lockhart, C SW NW sec. 14-21-36. Drlg. 2,655 ft.

General Crude Oil Co. No. 2 State "E," C NE SW sec. 32-21-36. T.D. 240 ft.; set 13⅜-in. casing.

Shell Pet. Corp. No. 1 State "E," C NE NE sec. 6-21-36. Drlg. 2,609 ft.

Gulf Oil Corp. No. 1 Janda "C," C NW SW sec. 15-21-36. Drlg. 3,410 ft.

Tide Water Oil Co. No. 2 State "E," C SE SE sec. 15-21-36. T.D. 3,455 ft.

Peerless O. & G. Co. No. 2 State, NE NW SW sec. 29-21-36. Location.

Devonian Oil Co. No. 4 State-Heasley, C SW SW sec. 5-21-36. Drlg. 2,677 ft. Shut down for repairs.

Atlantic Oil Producing Co. No. 1 State "K," C SE SW sec. 6-21-36. Drlg. 1,600 ft.

Humble Oil & Ref. Co. No. 4 Adkins, C NW SW sec. 10-21-36. Drlg. 3,205 ft.

Shell Pet. Corp. No. 1 State "J", C SE SW sec. 32-20-37. Rigging up rotary.

Gulf Oil Corp. No. 9 Bell-Ramsey, C SW SW sec. 4-21-36. T.D. 340 ft. Set 10¾-in. csg.

Gulf Oil Corp. No. 4 Orcutt, C SE NE sec. 6-21-36. Drlg. 350 ft.

Gulf Oil Corp. No. 1 Frona Leck, C NW NE sec. 14-21-36. Drlg. 2,670 ft.

Gulf Oil Corp. No. 7 Arnott-Ramsey "C," C NW NE sec. 21-21-36. Rig.

Continental Oil Co. No. 9-B-4 Meyer, C NE NW sec. 4-21-36. T.D. 1,275 ft.; set 10¾-in. csg.

Continental Oil Co. No. 10-B-4 Meyer, C NE NE sec. 4-21-36. Drlg. 1,070 ft.

Continental Oil Co. No. 11-B-4 Meyer, C SE SE sec. 4-21-36. Location.

Humble Oil & Refining Co. No. 5 Adkins, C SE SW sec. 10-21-36. Drlg. 301 ft.

Samedan Oil Co. No. 1 Marshall, C SW NW sec. 12-21-36. Rigging up rotary.

Continental Oil Co. No. 5-A-18 Lockhart, C SE SW sec. 18-21-36. Location.

Continental Oil Co. No. 6-A-18 Meyer, C NW NE sec. 18-21-36. Cellar and pits.

Continental Oil Co. No. 2-B-18 Meyer, C

NE NW sec. 18-21-36. T.D. 1,415 ft.; set 7⅝-in. csg.
Tide Water Oil Co. No. 1 State "G." C SE NE sec. 21-21-36. Rigging up rotary.
Continental Oil Co. No. 6-B-28 Lockhart, C NE SW sec. 28-21-36. Location.
Landreth Production Co. and Ohio Fuel Supply Co. No. 1 State "E," C SW NW sec. 22-21-36. Rigging up rotary.
Continental Oil Co. No. 4-A-13 Meyer, C SW NE sec. 18-21-36. T.D. 3,840 ft. Drlg. plug.
Texas Co. No. 2 State Aggies, C SW SE sec. 21-20-37. Cellar and pits.

Cooper Area

Plains Prod. Co. No. 1 R. L. Mosley, C NW SE sec. 34-24-37. T.D. 3,551 ft.; show sulfur water; P.B. 3,530 ft.; gauged 2,360,000 ft. gas; pulling tubing to run 7-in. casing.
Southern Oil Corp. No. 1 Vaughan, C SW SE sec. 15-24-36. Rig; shut down.
Southern Oil Corp. No. 1 Gates, C NW NW sec. 23-24-36. Drlg. 1,517 ft.
Skelly Oil Co. No. 5 Coates, C NE SE sec. 3-24-36. Rig.

Sims Area

Samedan Oil Co. No. 1 Parks, 330 ft. from S and 400 ft. from W lines, SW¼ sec. 14-22-37. T.D. 3,273 ft.; drilling plug.
Continental Oil Co. No. 1-A-22 Elliott, C SW SW sec. 22-22-27. Drlg. 3,130 ft.
Skelly Oil Co. No. 1 Ella Simms, C SW NE sec. 3-23-27. Location.
Penrose & Rowan No. 2 Cary, C NE SW sec. 22-22-37. T.D. 3,360 ft.; shut down for repairs.
Sun Oil Co. No. 1 Richards, C NE SE sec. 6-23-37. Drlg. 3,770 ft.
Humble Oil & Refining Co. No. 1 W. B. Farrell, C SW SE sec. 22-22-37. T.D. 830 ft.; drilling by tools.
Tide Water Oil Co. No. 1 A. Walden, C SE NE sec. 21-22-37. T.D. 340 ft.; shut down for repairs.
Magnolia Pet. Co. No. 1 Cary, C NE SE sec. 21-22-37. T.D. 685 ft.; reaming.
Penrose & Rowan No. 3 Cary, C SE NW sec. 22-22-37. T.D. 1,150 ft.; set 8¼-in. casing.
Continental Oil Co. No. 1-A-15 Elliott, SE SE SE sec. 15-22-37. Location.
Continental Oil Co. No. 1-A-21 Elliott, C SE SE sec. 21-22-37. Location.
Skelly Oil Co. No. 2 J. V. Baker, C NW NW sec. 27-22-37. Location.

Hobbs Area

Shell Pet. Corp. No. 1 State "E," C E half SE SE sec. 14-18-37. T.D. 4,374 ft.; P.B. 4,178 ft.; shut down for orders.
Continental Oil Co. No. 3-B-13 State, C NE SW sec. 13-18-37. T.D. 4,036 ft.; tested 650,000 ft. dry gas; drlg. 4,130 ft.
National Securities Oil Corp. No. 1 Linam, NE SE SW sec. 33-18-37; wildcat. Old well plugging back from 4,238 to 4,228 ft.; swabbed sulfur water; no oil; shut down for orders.
Shell Petroleum Corp. No. 4 Sanger, SW SW NW sec. 27-18-39. T.D. 270 ft.; set 12½-in. casing.

Chaves County

Tannehill No. 2 Campbell, C NE SE sec. 1-11-25. T.D. 1,400 ft.; pulled 6⅝-in. csg.
Comanche Drlg. Co. No. 2 Sloop & Purcell, C NE NE sec. 15-11-26. Drlg. 570 ft.

Lea County—Miscellaneous

Culbertson-Irwin & Stovall No. 1, J. B. Humphreys, C SE SW sec. 3-25-37. T.D. 3,620 ft.; 700 ft. oil in hole; contract depth; S.D.
Plains Prod. Co. No. 1 George Smith, C SE SE sec. 4-25-37. Drlg. 3,425 ft. Gas, estimated 5,000,000 ft.
Harry Leonard No. 1 Justice, SW NW NW sec. 20-25-37. T.D. 3,501 ft.; P.B. 2,970 ft. Estimated 25 to 30 bbls. oil and 3,000,000 ft. gas daily; testing.
Texas Co. and Repollo Oil Co. No. 1 Lanehart, C NE sec. 29-25-37. T.D. 2,770 ft.; waiting on cement.
Maljamar O. & G. Co. No. 6 Baisch, C NW SE sec. 21-17-32. T.D. 4,129 ft. Acidized; est. 65 bbls. daily; to reacidize.
Sun Oil Co. No. 1 Weatherly, C NE SW sec. 17-21-37, wildcat. Drlg. 3,560 ft.
Ohio Oil Co. No. 1 W. H. Turner, C NE SE sec. 29-21-37. Drlg. 2,560 ft.
Landreth Prod. Co. No. 1 J. W. Grizzell, C SE SW sec. 5-22-37. T.D. 1,256 ft.; standardizing.
Rowan et al No. 1 Mattern, C SW SE sec. 7-22-37. T.D. 1,045 ft. Set 8¼-in. casing.
C. & G. Oil Co. No. 1 E. Weir, C NE NE sec. 14-20-37, wildcat. Drlg. 2,670 ft.
Gulf Oil Corp. No. 1 E. King, C SW NW sec. 28-21-37. Drlg. 1,400 ft.
Gulf Oil Corp. No. 1 W. T. McCommack, C NE NE sec. 32-21-37. Drlg. 327 ft.
Continental Oil Co. No. 1 J. C. Farney, C SW SE sec. 5-23-36. Wildcat. Location.
Gulf Oil Corp. No. 1 S. J. Carr, C NW SW sec. 3-24-37. Drlg. 215 ft.
Gulf Oil Corp. No. 2 N. F. Humphreys, C NE NW sec. 25-25-36. T.D. 454 ft. Set 13-in. casing.
Sun Oil Co. No. 1 Stuart, C NW NE sec. 15-25-37. T.D. 3,283 ft. Set 5½-in. csg.
Continental Oil Co. No. 2-A-19 Eaves, C SW SW sec. 19-26-37. Location.
Shell-Devonian No. 1 Christmas, C NE NE sec. 21-22-36. T.D. 3,884 ft.; swabbed 30 bbls. in 5 hrs. Shot 350 qts. at 3,790 ft. Pumped 35 bbls. in 4 hrs.; testing.
Gulf Oil Corp. No. 1 J. A. Stuart, C SW NE sec. 10-25-37. Rigging up rotary.
Gulf Oil Corp. No. 1 L. M. Buffington, C NW SW sec. 13-25-37. Drlg. 560 ft.
Sun Oil Co. No. 1 Lanehart, C SE SE sec. 20-25-37. Rigging up rotary.
Humble O. & R. Co. No. 1 Lanehart, C NE SW sec. 21-25-37. Drlg. 575 ft.
Humble O. & R. Co. No. 1 Hadfield, C NW SE sec. 21-25-37. Drlg. 380 ft.
Magnolia Petroleum Co. No. 1 E. O. Carson, C NW SW sec. 28-21-37. Cellar, pits.
Skelly Oil Co. No. 1 Stuart, C NE NW sec. 15-25-37. Location.

Eddy County

Etz Bros. No. 2 State, C NW SW NE sec. 16-17-30. Drlg. 2,645 ft.
Ohio Oil Co. No. 1 State-McCullough, SE SW SW sec. 16-17-30. T.D. 3,097 ft.; fishing.
Premier Pet. Corp. No. 2 Dexter "E." NW SW NE sec. 20-17-30. Drlg. 3,202 ft.
Red Lake Oil Co. No. 6 State, NE NE SW sec. 22-17-28. T.D. 1,954 ft.; 300 ft. oil in hole; shot at 1,925-37 ft. Cleaning out; est. 50 bbls. daily.
D. & B. Oil Co. No. 1 Jenkins, NW SW NW sec. 20-17-30. T.D. 3,258 ft.; testing; est. 200 B.P.D.
Dexter & Berry No. 1 Berry, NW NE NW sec. 21-17-30. T.D. 2,715 ft. Shut down for repairs.
Dooley & Dixon No. 1 Commerce, C W½ NW NW sec. 18-20-27. Drlg. 868 ft.

NORTHWEST NEW MEXICO

Bernalillo County

Norine Realty Co., Inc., No. 2 Gallegas grant, SE NW NW sec. 19-11n-4e. Drlg. 1,500 ft. sd. and gravel.

Guadalupe County

Anton Chico Dev. Co. No. 2 fee, NW NE SW sec. 20-9n-17e. Drlg. 785 ft. in sand.

Harding County

Khasy et al No. 1 De Baca, C sec. 19-20-31e. Rng. 8¼-in. at 847 ft.; 10-in. at 250 ft.

McKinley County

Seward and others No. 1 State, NE cor. section 2-19n-9w, in the Red Mountain district, was plugged and abandoned at 535 feet.

San Juan County

Kutz Canon O. & G. Co. No. 1 Day, SW SW SW sec. 20-28-10w. S.D. 4,400 ft.
Nick Spatter No. 1 fee, C NE SW sec. 32-21-11w. S.D. 1,780 ft.; T.A.
Southern Union Gas Co. No. 6 Government, C NW NW sec. 19-28-10w. Running 8¼-in. at 1,215 ft.

San Miguel County

A Denver group, headed by Clarence L. Ireland, former attorney general of Colorado, has acquired the leases on the Vegas dome formerly held by the Starr-Kennedy Oil Co. and has erected an all-steel standard rig over the old company's No. 3 Adams, NE cor. section 25-17n-16e, and will continue the test which is bottomed at 5,082 feet. The Starr-Kennedy Co. lost its rig, camp and equipment by fire in 1934 and subsequently gave up the leases. Prior to the fire it had a run of bad luck. The new interests are prepared to test the area. The well is bottomed in hard lime a short distance above the Pennsylvania series. Glenn A. Taggart, of Denver, is treasurer, and S. W. Pressey, general manager.

Torrance County

45 Pet. Co. No. 1 Greenfield, C NW SW sec. 17-9-8e. Drlg. 1,750 ft. wh. L.
Bruce Frazier No. 1 Frazier, SE sec. 12-2n-31e. Drlg. 1,575 ft. sd. and L.

COLORADO

Adams County

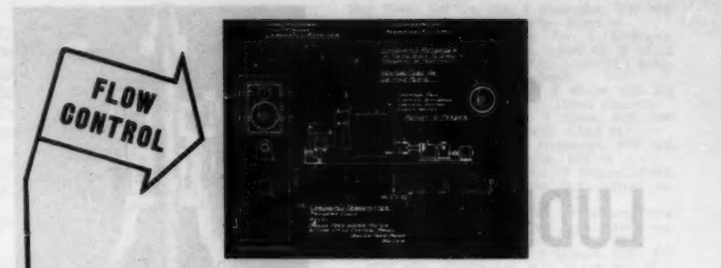
E. M. Butler et al No. 1 Kate Edwards, NW SW NW sec. 15-3s-66w. M.I. portable rotary.
Glenridge Oil Corp. No. 1 Hills, SE SE NE sec. 27-3s-64. Deepened to 4,202 ft. and cmtd. to bottom.
Riddle Pet. Co. No. 1 Baxter, C SW sec. 2-3s-6w. S.D. 700 ft. for D.P.

Archuleta County

Wm. E. Hughes Estate No. 6 Gramps, NW NE SE sec. 24-33n-2e (unsurveyed). Spdg.
Wm. E. Hughes Estate No. 7 Gramps, NW SE SE sec. 23-33n-2e (unsurveyed). M.I.M.
Carl D. Lindstrom No. 1 Crowley, SE SE SE sec. 3-22n-2e. M.I.M.
Oil City Pet. Co. No. 1-A Garnett, NW NE NW sec. 25-33n-2e. S.D. 1,515 ft.; top Dakota series 1,415 ft.
Oil City Pet. Co. and Archuleta O. & G. Co. No. 1 Reeder, Lot 5 (SW SE SW), sec. 24-33n-2e. Through the gravel and into shale at 355 ft., where 10-in. was set.
H. L. Kendrick No. 1 Crowley (unsurveyed), sec. 2-32-1. S.D. 1,125 ft. for 6¼-in.

Baca County

Paul R. Robb Pet. Corp. No. 1 Lovett, NW NW NW sec. 24-32s-48w. Cmtd. 12½-in. at 390 ft.



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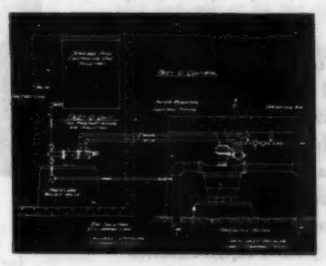

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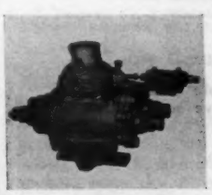

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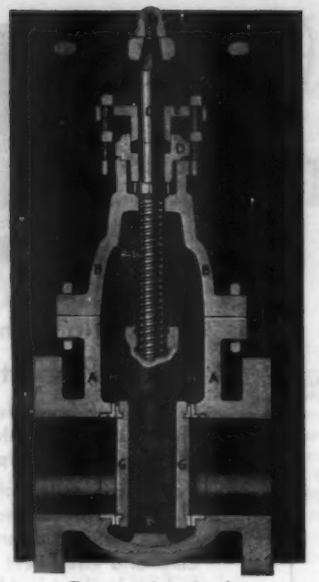

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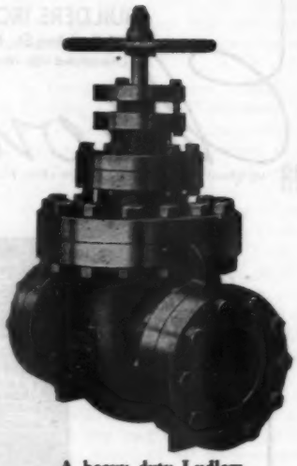

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Offices in all principal cities

La Plata County

McGarr Pet. Co. No. 1 Pinton Mesa, CSL NE NE sec. 34-35n-12w. Drlg. 3,200 ft.

Las Animas County

Mountain States Oil Corp. No. 1 Nikola, C NE SE sec. 10-34n-62w. S.D. 1,513 ft.

Lincoln County

Consolidated Smelting & Metals Co. No. 1 Hancock, NE NE sec. 7-17s-52. T.D. 2,001 ft. in sdy. sh.; 1,000 ft. water in hole; lowering 8¼-in. for formation H.O.

Morgan County

Swisher et al No. 1 Lunt, 92 ft. W of E line and 360 ft. N of S line, sec. 3-4n-60. S.D. 1,449 ft.

Moffat County

The Texas Co. No. 7 Knowlton, NE cor. Lot 8 (NE NW NW) section 10-4n-91, an old well in the Dakota, which resumed last fall to deepen to the Sundance, was completed at 4,557 in the Sundance at 4,503-57 feet. It pumped 254 bbls. of fluid first 16 hours, of which 85 bbls. was pipe line oil. It was originally completed in 1926 at 3,891 feet for 700 bbls. initial in the Dakota.

The Mountain Fuel Supply Co. will resume drilling this year on the Powder Wash structure in Moffat County near the Wyoming line and 20 miles east of the Hiawatha gas field. Only one well, the discovery, has been drilled on this structure. This well, the Mountain Fuel Supply Co. No. 1 Musser, C NE section 5-11n-97, was completed early in 1931 in the upper Wasatch formation at 2,152 feet for 35,188,000 feet of gas per day. The horizon was encountered about 2,000 feet higher than at Hiawatha and at the time it was reported to be the highest producing horizon in the geological column in the Rocky Mountain area.

The Mountain Fuel Supply Co program calls for development work at Powder Wash and in the South Baxter Basin field in Sweetwater County, Wyoming, on quite an extensive scale and approximately $500,000 will be expended in these areas in drilling and other development work.

Ohio Oil Co. No. 1 Robertson, C SW SW sec. 5-6n-92w. Location.

Montezuma County

McElmo Oil Co. No. 1 West, NE NW NE sec. 21-36n-17w. Contracted with Perry Coon to comp.; T.D. 3,705 ft.; drove tools to bottom; fshg.

Park County

The South Park Oil Co. No. 1 State, the discovery well in the Hartsel district, underreamed and lowered the 6¼-inch to 4,152 feet, 8 feet off of bottom at 4,160 feet. Then it cored 3 feet to 4,163 feet and stopped for a swabbing test. It began late Wednesday afternoon to test and at last reports was swabbing at the rate of 200 bbls. a day. It is planned as soon as the swabbing test is completetd to resume coring.

The South Park Oil Co. will begin spudding in a few days on its No. 1 LeBert, to the south of the discovery. Reports of several wells to be drilled by various interests have not yet been confirmed. One, however, is expected to spud by June 1 on W half section 11-9s-76, about 14 miles north of the discovery and 4 to 5 miles south and east of Como. W. A. Stewart, H. Brown Canon and Mayor Ben Stapleton, of Denver, are prime movers in this test.

South Park Oil Co. No. 1 Le Bert, NE NE NW sec. 21-11s-76w. R.U.
South Park Oil Co. No. 1 State, SE NE SW sec. 16-11s-76w. T.D. 4,160 ft.; testing.

Routt County

Mid-Colo. Pet. Co. No. 1 Omoholt, NE SE SE sec. 29-4n-87w. Set 8¼-in. on bottom at 1,910 ft. and S.D. acct. bad roads.

Washington County

Indian Territory Ill. Oil Co. and Foster Minerals Corp. No. 1 Vorce, C NE NE sec. 28-1s-49w. M.O.G. wtg. on rig biders.

Weld County

Continental Oil Co. No. 1 State Bank of Trenton, C SW NE sec. 21-8n-59w. Drk. and drlg. W.W.

Yuma County

Indian Territory Ill. Oil Co. No. 1 Strangways, C NW SW sec. 21-2s-43w. Material O.G. wtg. for rig biders.

WYOMING

Albany County

California Co. No. 3 Hoist, 1,650 ft. W of E line and 970 ft. N of S line, sec. 18-17n-77w. Drlg. 3,327 ft.
California Co. No. 1 Wilson, NW SW SW sec. 18-17n-76w. Drlg. 1,920 ft.
James Lake Oil Co. No. 1 George & Hunt, NW NE SE sec. 5-17-75w. R.U.

Big Horn County

W. O. Taylor and others No. 1 Hoskins, more than a mile to the southeast of the nearest production on the Byron dome, which is showing for a well 12 feet in the Tensleep at 5,365 feet, total depth, swabbed 300 bbls. in a test and is estimated at 150 bbls. a day as it stands. The 8¼-inch was cemented at 5,252 feet in the top of the Embar. It will drill a little deeper before completing. This test, which is in a fault block, is located on an island in the Shoshone River.

J. W. Bales No. 1 Parker, C SW SW sec. 23-4-89. S.D. 690 ft. for pipe.
Joan Oil Co. No. 1 Howell, Lot 63 (NW SE NE) sec. 32-55n-97w. Resuming at 1,190 ft.
Peter Evanhoff et al No. 1 McAlister, Lot 4, NW NE SE sec. 35n-87w. T.D. 2,350 ft.; C.O.
Ohio Oil Co. No. 1 Orson Vail, SW NW NE sec. 23-56n-97w. Rig.
Ohio Oil Co. No. 1 Robert Till, C SE SW sec. 24-56n-97w. Drlg. 3,031 ft.
Stock Oil Co. No. 1 Yates, CSL SW NE sec. 23-56n-97w. Drlg. 797 ft. (cor.).
W. O. Taylor et al No. 1 Hoskins, Lot 5 (SE SE) sec. 25-56n-97w. T.D. 5,368 ft.; testing.

Carbon County

The Ohio Oil Co. No. 9 Harrison & Cooper, SW cor. section 35-20-78, Rock River field, an old producer in the Lakota at 3,102 feet, will be plugged back to that horizon after being deepened to test the Sundance. It drilled through the entire Sundance section to the top of the red beds at 3,800 feet. The basal Sundance was absent and water was encountered in the upper Sundance topped at 3,436 feet. While several old wells deepened in the past few months have come in as good producers in the Sundance, the area for that horizon appears to be rather small and hardly comparable with Sundance sand wells in other fields. The wells deepened have found their production in the upper bench of the Sundance.

General Pet. Corp. No. 1 Union Pacific, SW NW sec. 5-19n-83w. Drlg. 100 ft. (cor.).
Ohio Oil Co. and California Co. No. 2 Union Pacific, C NE NE sec. 25-21n-79w. Drlg. 3,460 ft. in shale.
Ohio Oil Co. No. 7 Diamond Cattle, N½ sec. 35-20n-78w. Rig; W.O. tools.
Ohio Oil Co. and California Co. No. 3 Union Pacific, C NE SE sec. 23-21n-79w. Drlg. 2,118 ft.
Ohio Oil Co. No. 1 Dixon, NE NE SE sec. 34-20n-78w. T.D. 3,314 ft.; cmtd. 4½-in. liner on top Sundance at 3,250 ft.
Ohio Oil Co. No. 2 Dixon, SE NE SE sec. 34-20n-78w. R.U. to deepen old well from 3,094 ft. to Sundance.
Union Oil Co. of California and Mutual Oil Synd. No. 1 Union Pacific, 1,890 ft. from E line and 1,320 ft. from S line, sec. 1-12-78w. Resumed drlg. at 4,480 ft.

Converse County

Chadron-Osage Oil Co. No. 1 State, SW SW SW sec. 16-32n-69w. Drlg. 1,918 ft.
J. A. Olson No. 1 Reese, C NE SE sec. 10-32n-65w. M.I.M.

Fremont County

The superintendent of the Shoshone Indian reservation in Fremont County will receive bids on May 15 at Fort Washakie for a prospecting permit on 19,040 acres of reservation

land under an offer that departs from the past policy of making straight leases. The permits will run for one year at a rental of 25 cents an acre plus the bonus bid and $1 per acre per year if the permit is extended. The conditions provide that the purchaser of the permit make a seismograph survey of the area to determine whether a structure exists. The cost of the survey is estimated at $5,000. If this preliminary survey indicates the presence of a structure, the permittee must then drill a well or do additional geophysical work at a maximum cost of $20,000. The permittee then will be allowed to select one-half the acreage in alternate tracts of 160 acres with the privilege of bidding on the remainder of the acreage if it is offered for sale. The permittee must agree to unitization of the area. The land to be offered is in Townships 4 and 5 north, Ranges 1 and 2 west, and lies to the south and southwest of the fold upon which is located the Maverick Springs structures known as the Big, Little and Circle Ridge domes. These structures have a number of wells capped with an estimated capacity of close to 10,000 bbls. a day of black oil. Most of these wells were drilled about 18 years ago.

In 1933 the department of the interior issued an order that unless the field was developed and the oil marketed the leases would be canceled. The operators claimed there was no market for the oil. A compromise was reached whereby the owners of the leases agreed to pay an additional rental of $1 per acre per year. There is no pipe line or railroad facilities. Plans were discussed at that time for both a railroad and a pipe line, but the depression caused these to be dropped. The fact that the prospecting permit is being offered on adjacent acreage indicates that plans are under way for bringing about the development of the area. The Ohio Oil Co., the Continental Oil Co. and the Texas Co. are among the owners of leases on the proved structures.

A sidelight on the situation developed this week when George A. Brimmer was denied a review by the Supreme Court of the United States at Washington on his suit to recover $780,000 from the Union Oil Co. of California for alleged breach of contract in its failure to develop the fields. The Continental Oil Co. subsequently acquired the Union holdings, but was not a party to the suit.

The Argo Oil Co. has sold its leases, wells and storage in the old Pilot Butte field to J. A. Charboneau and Clarence R. Mazey, of Billings, Mont. Included are several small wells, pumping equipment and 20,000 bbls. of oil in storage.

Tropic Oil Co. No. 1 Government, C SE SW sec. 34-27n-30w. T.D. 2,550 ft.; running 4½-in.

Sinclair-Wyoming Oil Co. No. 1 Kelsch, NE SW sec. 1-33n-92w. Bldg. rot. rig.

Hot Springs County

California Exploration Co. No. 2 Government, NW SW NW sec. 4-44-96. T.D. 4,245 ft.; P.B. to 4,165 ft.; shot 80 qts.; C.O.

Ohio Oil Co. No. 73 Mill Iron Cattle Co., NE SW SE sec. 19-4n-98w. Smtd. 10¾-in. at 1,193 ft.

Stanolind O. & G. Co. No. 20 State-Ridgely, SE NE SE sec. 19-46n-98w. T.D. 3,931 ft.; top of Embar 3,908 ft.; 6⅝-in. cmtd. 3,913 ft.; R.U.S.T.

Lincoln County

Senrab Oil Corp. No. 3 Government, CSL SE NW sec. 10-26n-113w. S.D. 1,020 ft.

Natrona County

The Empire State Oil Co. No. 15 Government, NW SE NE section 11-33-83, Poison Spider field, was completed in the Sundance at 1,440 feet, total depth for 50 bbls. initial on the pump. The sand was at 1,333-1,440 feet.

Niobrara County

Two wells in Lance Creek are near completions. The Ohio Oil Co. No. 3 Rohlff flowed 100 bbls. per hour on a short test and then went dead. It is cleaning out and preparing to complete. It is the most northerly Sundance sand well in the pool and an offset on the north to the same company's No. 2 Rohlff. It showed some water in the first testing, but this was exhausted and it looks as if it will make 1,500 to 2,500 bbls. initial.

The Argo Oil Co. No. 7 Elliott is about ready to test.

Argo Oil Co. No. 7 Elliott, C NE NW sec. 5-35n-65w. T.D. 4,004 ft.; top red beds 3,993 ft.; top lower Sundance 3,930 ft.; 7-in. cmtd. at 3,932 ft.

Black Hills Ref. Co. No. 1 Mills Est., C SW NW sec. 27-36n-64w. Spudded and S.D. account of weather.

Continental Oil Co. No. 6 Rohlff, C SW SW sec. 32-36n-65w. Drlg. 3,200 ft.

Continental Oil Co. No. 4 Joss, 90 ft. W of C SW NE sec. 6-35n-65w. Drlg. 2,000 ft.

Continental Oil Co. No. 2 Apex-3, C SE NW sec. 34-36n-65w. Bldg. rig (first report).

Lewis Gokel No. 1, SW NE sec. 31-35n-62w. Running 10-in. to 200 ft.

J. H. Huber Co. No. 1 Jones, NE SE NW sec. 6-25n-65w. T.D. 4,096 ft.; P.B. to 4,032 ft.

Ohio Oil Co. No. 3 Agnes Rohlff, C SE NE sec. 32-36n-65w. T.D. 3,958 ft. in top red beds; testing.

Sheridan County

Beaver Creek Oil Co. No. 1 Allison, SW SE sec. 15-55n-85w. Drlg. 3,668 ft.

MONTANA

Fallon County

The Montana-Dakota Utilities Co. No. 1, the discovery well on the Little Beaver dome, is still shut in waiting for pipe. The 6⅝-inch is being moved in and will be set at around 6,710 feet. An unofficial report gives the gasoline content of the crude as 25 per cent. The oil tests 25 gravity and has less than 1 per cent sulfur content.

Montana-Dakota Utilities Co. No. 1, NE NW section 17-4n-6e. S.D. 6,797 ft.; M.I. 6⅝-in.

Fergus County

Minnesota Co. No. 1 Fenholt, SE NW SW sec. 24-21n-18e. Drlg. 2,155 ft.

Judith Operating Co No. 2 Government, NW NE sec. 25-22n-17e. Drlg. 666 ft.

H. C. Rowland No. 3 Government, CSL NE SW sec. 18-17n-24e. Spdg. 50 ft.

Kalispel-Kevin Oil Co. No. 2 Emmons, C SW SE sec. 20-21-18e. Drlg. 576 ft.

Glacier County

Four wells were completed in the Cut Bank field. The most interesting of these was the Texas Co. No. 1 Stanley J. Walker, C NE NE section 2-35-6w, at the extreme northern end of the field where three wells have been drilled. No. 1 Walker is an east offset to the Montana Power Gas Co. No. 1 Rigney, which pumped 133 bbls. initially, and a diagonal offset to the southeast to No. 1 Hall, the most northerly well in the pool, which swabbed 312 bbls. the first 24 hours. The Texas Co. No. 1 Walker swabbed 100 bbls. the first 24 hours and pumped 60 bbls. the first 22 hours at a total depth of 3,000 feet. There was no Sunburst sand present. The pay in the Cut Bank was at 2,979-92 feet. The elevation is 4,011 feet.

The Texas Co. No. 1-A Tibal-121, C SW NE section 36-33-6w, 17 miles south of its No. 1 Walker, swabbed 70 bbls. the first 24 hours at a total depth of 2,968 feet. Anderson and others No. 1 Anderson, NE SW NW section 26-35-6w, has 1,000 feet of oil in the hole at 2,871 feet, but has not been tested. The Sunburst at 2,760-90 feet showed a little water. The pay in the Cut Bank was at 2,855-68 feet.

A. E. Crumley No. 1 Allotted-113, C SW SE section 31-33-5w, swabbed 50 bbls. daily after shooting with 60 and 40 quarts. The Sunburst at 2,887-95 feet was dry and the pay in the Cut Bank was at 2,933-45 feet. Elevation is 3,687 feet.

Consol. Gas Co. No. 1 Allotted-114, CNL NE SW sec. 31-33n-5w. Spdg. 160 ft.

A. E. Crumley No. 2, Allotted-113, SW NW SE sec. 31-33n-5w. Cellar (first report).

Dakota-Montana Oil Co. No. 1 Winkler, SW NE NW sec. 36-35n-6w. T.D. 2,160 ft.; rig burned down.

Goodman Oil Co. No. 1 Tribal, SW NW SW sec. 25-33n-6w. Drlg. 2,300 ft.

Hannah-Porter Co. No. 1 Allotted-130, C Lot 3, sec. 6-32n-5. R.O.G.

B. V. Hole No. 1 Tribal, C NW SW sec. 33n-6w. Cellar.

B. V. Hole No. 1 Allotted-124, 640 ft. out of NE cor. sec. 1-32-6w. Loc.

R. C. Jeffries No. 4-A Lukens, NE NE NE sec. 12-32n-6w. Dlg. 1,810 ft.

Kincheloe-Hanlon No. 2 State, NE NE NE sec. 36-33n-6w. R.O.G. (first report).

Jack Marshall No. 1 Tribal-126, Lot 7, sec. 7-32n-5w. T.D. 2,915 ft. C.O. 2,911 ft.

Kately No. 3 Drumheller-Ward, C Lot 2, sec. 10-34n-6w. Drlg. 2,000 ft.

Montana Headlight Oil Co. No. 3 Britton, NE NE SE sec. 11-34n-6w. Drlg. 2,235 ft.

Montana Power Gas Co. No. 2 Van Ormer, C SE SE sec. 8-33n-5w. Drlg. 1,595 ft.

Montana Power Gas Co. No. 4 Seeba, SW SW NW sec. 2-34n-6w. Cellar (first report).

Montana Power Gas Co. No. 1 Warfield unit, CWL SW sec. 9-33n-5w. Drlg. 1,550 ft.

Montana Power Gas Co. No. 1 Carrigeaux, 125 ft. W of C NE NW sec. 28-33n-5w. Top Colo. 710 ft.; 10-in. cmtd. 732 ft.; W.O.C.

Nadeaux Bros. No. 3 Farmers State Bank, C SW NE sec. 17-33n-5w. Top Colo. 575 ft.; 10-in. 606 ft.

Par Oil Co. No. 6 Haines, NE SW NE sec. 3-34-6w. Dlg. 2,868 ft.

Santa Rita O. & G. Co. No. 1 Shearon, 660 ft. S of N line and 349 ft. W of E line, sec. 34-36n-6w. T.D. 3,092 ft.; cmtd. 7-in. at 2,960 ft.

Santa Rita O. & G. Co. No. 1 Barrington, SE SW NW sec. 24-33n-6w. Cmtd. 7-in. at 2,860 ft.; W.O.C.

Neil Spencer No. 2 Tweedy, 925 ft. NS line, 1,980 ft. 2 WL SE sec. 25-33n-6w. Drlg. 560 ft.

Stanley Gray, No. 1, Allotted-132, NW SE NW sec. 22-34n-7w. Drlg. 1,000 ft. (formerly Jackson et al).

R. C. Tarrant No. 6 Britton, C SE SW sec. 12-34n-6w. Drlg. 940 ft.; Colo. at 450 ft.; 10-in. at 465 ft.

R. C. Tarrant No. 2 Reikhoff, SE NE SE sec. 3-34n-6w. Drlg. 2,375 ft.

Tarrant-Long, No. 5 Miller, C NE NE sec. 24-34n-6w. Spdg. 200 ft. (first report).

Texas Co. No. 2-B Allotted-122, SE NW NW sec. 6-32n-5w. Drlg. 2,645 ft.; Colo. at 515 ft.

Texas Co. No. 2, Unit 9, C SW NE sec. 9-32n-5w. M.I.M.

Whetstone et al No. 1 Tribal, C SE NW sec. 36-33n-6w. Drlg. 2,925 ft.

Wilkinson et al No. 1 Tribal, Tr. 127, C NE NE sec. 1-32n-6w. Bldg. rig.

Wilkinson et al No. 1 Tribal, 126, C NE NW sec. 7-32n-5w. Drlg. 515 ft.

Petroleum County

West Dome Oil Co. No. 1, SW SE NE sec. 9-15n-29e. Drlg. 1,293 ft.; first Cat Creek at 1,240-88 ft.; (est. 5 bbls.); cased off with 5 3/16-in. at 1,290 ft.

Judith Basin County

Fletcher E. Hunt No. 3, NW SE NE sec. 30-14n-15w. Drlg. 431 ft.

Pondera County

Wm. M. Fulton No. 1 Price, SW NE NE sec. 18-27-4w. P.B. to 1,300 ft.; stdg.

Clinch Pet., Ltd., No. 1 Hollan, NW SW NW sec. 12-28-6w. Drlg. 1,320 ft. (formerly Norden Corp.).

Warren Hastings No. 2 Erickson, NW SW NW sec. 10-27n-4w. Landed 10-in. at 511 ft.

Texas Co. No. 1 Valier Unit No. 1, C NW SE sec. 32-31n-5w. T.D. 585 ft.; running 13-in.

Gordon Campbell No. 1 Hughes, NW NE NW sec. 13-30n-4w. Spdg. 150 ft.

Jones-Chambers No. 1 Erickson, SW SE SW sec. 3-27-4w. Rig timbers on loc.

Teton County

R. C. Tarrant No. 1 Wallenstein, NW NW SW sec. 9-27n-5w. M.I.M.

Toole County

Nine new operations and two completions were reported in the Kevin-Sunburst field. The Imperial-Craig Oil Co. No. 3 Martin, CEL SW SE section 18-35-1w, had 60 feet of oil in the hole from the Ellis-Madison contact at 1,594-1,618 feet; will acidize.

Coolidge & Coolidge No. 1 State, NW cor. section 36-36-2w, made 90 bbls. on the pump first 16 hours from the Sunburst at 1,500-31 feet.

A. E. Crumley No. 9 Shaw, SE SW NE sec. 35-36n-2w. R.O.G. (first report).

A. E. Crumley No. 6 Fryberger, NE SE SE sec. 24-35n-3w. Drlg. 350 ft.

Big West Oil Co. No. 1 Dalquist, SW NE NW sec. 21-35n-2w. Drlg. 1,000 ft.

Carscallen & Mitchener No. 1 Krueger, 1,320 ft. W of E line, 1,980 ft. S of N line, sec. 10-34n-2w. T.D. 1,650 ft.; acidized; did not recover load.

Coolidge & Coolidge No. 2 Shaw, SE SE SE sec. 26-36n-2w. R.U. (first report).

Eddy & Engleking No. 1 Sohn, SW SW NE sec. 26-35n-3w. Drlg. 1,500 ft.

Fraser & Smith No. 1 Crabtree, NE NE SE sec. 14-34n-2w. Drlg. 430 ft.

Imperial-Craig Oil Co. No. 17 Bluhm, CWL NE NE sec. 19-35n-1w. R.U. (first report).

Imperial-Craig Oil Co. No. 18 Bluhm, NW NE NE sec. 19-35n-1w. Loc. (first report).

Monopeg Oils, Ltd., No. 3 Dipple, CSL SW NW sec. 28-35n-1w. T.D. 1,450 ft.; R.U. to drill in.

Munger No. 1 Thornton, NW SW SW sec. 8-35n-2w. Loc. (first report).

Burt Smith No. 1 Engel, SE SE NE sec. 2-35n-3w. Drlg. 800 ft.

Verne Smith No. 1 Haugan, SE SW NW sec. 2-35n-3w. Running 8¼-in. at 1,095 ft.

Welch Bros. No. 1 Dewald, SW NE NE sec. 26-36n-2w. Drlg. 1,023 ft.

Watson No. 1 Leach, SE SE NE sec. 31-35n-3w. M.I.M. (first report).

Superior Oil Co. No. 4 Haugen, SW SE NE sec. 11-35n-3w. Drlg. 1,200 ft. (first report).

Nepstead & Vanderpas No. 1 Solberg, NE NW SE sec. 20-35n-3w. R.O.G. (first report).

UTAH

Grand County

Columbia Crude Co. No. 1 Rath, SW SE sec. 12-25n-20e. Drlg. 515 ft. in upper Hermosa.

Utah Southern Oil Co. No. 1 Hyde, SE NW NW sec. 33-22e. S.D. 4,600 ft. for sand line.

Glenn Ruby et al No. 1 State, NE SE SE sec. 34-31s-16e. T.D. 1,922 ft. in top of Shinarump; ran 6¼-in.; prep. to core.

Utah County

Diamond Oil Co. No. 4 Govt., CSL SE NW sec. 16-8s-5e. S.D. 3,591 ft.; rebldg. road after landslide.

Kansas Fields

(Continued from Page 266)

SE NW section 9-17-7, in the Wilde area of Morris County, has been temporarily abandoned at 3,570 feet, total depth. Viola lime was topped at 2,145 feet; Wilcox sand, 2,168 feet. It had a hole full of water at 2,247 feet, and had water as far up the hole as 1,000 feet.

Grant County

Piney Oil & Gas Co. No. 1 Hastings, C SW section 2-29-36w, in the Hickok area of Grant County, produced 9,000,000 feet of gas at 2,870 feet, total depth, and was completed.

Stephens County

Stevens County Oil & Gas Co. No. 2 Young, C NE section 14-34-39w, in the Hugoton area of Stevens County, was completed as a gasser at 2,738 feet, total depth. Gas measured 5,500,000 feet daily.

Canadian Fields

(Continued from Page 258)

Royalties' No. 2 has been spotted in LSD 15, section 16-18-2w5, southwest of Highwood-Sarcee No. 2.

Tests in the Foothills

In the Forest Reserve area west of Olds, Hunter Valley Oil Co. No. 1 McLaren, LSD 12, section 13-31-10w5, is below 5,470 feet.

On the Jumping Pound structure west of Calgary, North West Co. No. 3 Bow Valley, LSD 6, section 31-24-4w5, is deepening below 1,500 feet. It got some gas in the upper horizons, but failed to encounter the oil shows met in Imperial Oil No. 2 Bow Valley, drilled some years ago a short distance north.

On the Kootenay Dome, a road is being built to location of Roxana Petroleum No. 1 in section 8-24-7w5 and equipment will be moved in toward the end of May. A. P. Phillips will be head driller and the outfit will run two tours, with standard tools. The potential production is around 1,500 feet.

Southwest Texas District

FRIO SAND IN SAXET FIELD MAY INCLUDE LARGE AREA

By GEORGE WEBER

SAN ANTONIO, Tex., May 11.—An important extension to the recently discovered 5,800-foot Frio sand in the Saxet field of Nueces County, opening of a new gas field in McMullen County; indications of another gas field in Duval County, and shows of oil in an Atascosa County wildcat featured the developments of the week in Southwest Texas. Drilling activity which has strengthened in the principal fields of this section has continued to show increased volume in the smaller proven areas, and late discoveries are receiving initial development. Despite the abandonment of several wildcat tests throughout the area, wildcatting, normally strong in Southwest Texas increased further with new locations announced in widespread sections.

The completion of Morgan Gulf Oil Co. No. 2 Rand Morgan, located in Survey 403, marked a 7,000-foot southwest extension to the new sand producing in the Saxet field. The extension producer was brought in for an estimated flow of 12 bbls. per hour through a three-sixteenths inch choke from the sand cored at 5,836-44 feet. Pressure on the tubing gauged 850 pounds and on the casing 1,000 pounds.

The 5,800-foot Frio sand, sixth and deepest yet to be brought into production in Saxet was opened by A. F. Holliday about a month ago when No. 1 Griffith, an old well making gas was deepened and brought into production at 5,816-44 feet. That producer ganged about 500 bbls. per day.

According to authorities on this field, the new sand shows indications of being a blanket sand, and if so, will constitute a major factor in the development of large Saxet production. Simultaneous with the completion of the southwest extension, a shorter, 1,000-foot northward extension to the sand was seen as Southern Minerals Corp. No. 1 Maston in the southeast corner of the G. Frank Survey tested 2,000 feet of pipe line oil in 10 minutes at 5,803-23 feet.

Activity in the Saxet field aside from this new play which is north of the town of Clarkwood, continues to center about that district, with completion of five new producers including the Morgan well, and one abandonment.

Concentrated Drilling

In the eastern part of Nueces County, on the edge of Corpus Christi, the Saxet Heights field continues to show the greatest concentrated drilling activity in the entire section of the state. In this field six more producers were brought in and an important northwest extension was seen as a possibility. Hiram Reed No. 1 Katherine Quinn located several hundred feet west of Taylor Refining Co. No. 1 John Dunn present edge producer was reported to have a show. The test is bottomed at 4,117 feet.

In the same county, an area opened last year near the town of Driscoll was again receiving attention as O. W. Killam's No. 1 Ellick set casing at 3,822 feet. The test is located in section 109 of the George Paul Subdivision about 1 mile southwest of Santa Clara Oil Co No. 1 Driscoll, discovery well of the Clara Driscoll field. The Killam test is running about 6 feet high with reference to the Driscoll well, and drilling plugs scheduled for the week-end will be watched with great interest by operators concerned with that area.

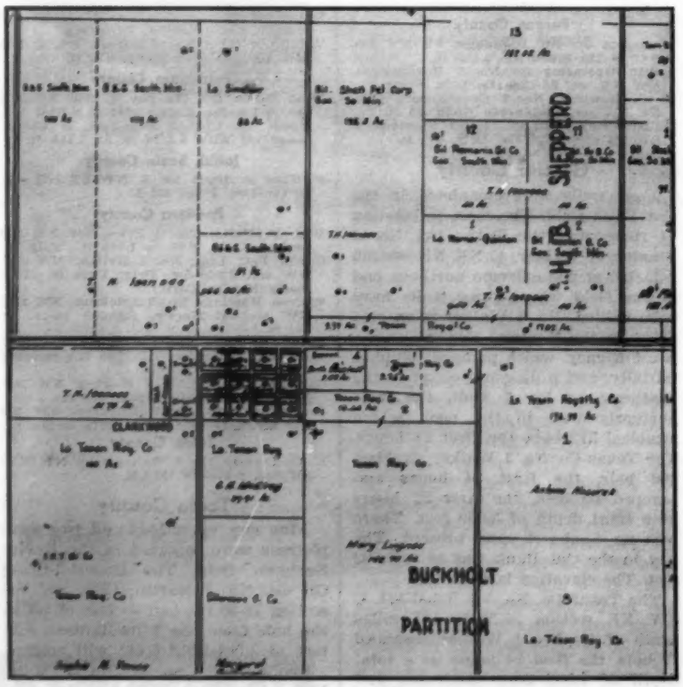
Two Blowouts

High pressures in this region were responsible for two blowouts during the week, both occurring in tests of the Texon Drilling Co. The first wild well was that company's No. 3 Lingnau on the southeast edge of the Clarkwood townsite. It was shut in and abandoned Monday, followed shortly by a blowout in the company's No. 1 Rambo located on the south edge of the Plymouth field in San Patricio County. The latter blowout burned for nearly three days before being shut in.

Another completion in the Taft field of San Patricio County was made during the week, and the increased drilling activity in this field will soon reveal its probable importance as a producing area. Since the discovery, operators have met with indifferent success in developing the field with failures in the original 4,900-foot sand and subsequent opening of a 4,000-foot producing horizon.

Wildcatting through this coastal section failed to show any definite developments during the week. The Benedum & Trees No. 2 Welder which has attracted attention for several weeks as a possible discovery has again failed to make a producer in the 5,700-foot sand which showed oil, and a whipstock is being set to sidetrack the hole back down to the 6,110-foot level where further saturation was encountered. The Oso of Flour Bluffs district of southern Nueces County is getting added activity with the moving in of a new test and resumption of another.

Immediate development is seen for the new Bentonville field opened recently by Texon Drilling Co. No. 1 Rolston in Jim Wells County. The new producing area located on the eastern edge of the county is held primarily by Stanolind Oil & Gas Co. which is moving in with two offset tests, while the company which opened the field is starting a third offset test.



Clarkwood section of Saxet field, Nueces County, where considerable play has developed in the 4,400-foot sand. Activity is extending in all directions. The abandoned well southeast of the townsite is Texon Drilling Co. No. 1 Lingnau, which blew out in the 4,400 ft. sand

(Map by Porter Regenold, Corpus Christi)

Increased Wildcatting

A marked increase in both wildcatting and proven field drilling in McMullen, Live Oak, Bee and Goliad Counties has occurred in the past few weeks. A total of 20 wildcats are drilling in this section, and fields, particularly North Pettus in Goliad County and Dirks in Bee are getting added development.

The new gas field in McMullen County which has been named the Rhode field was definitely opened during the week by Magnolia Petroleum Co. No. 2 Kincaid. The test had an odor of oil when it tested gas at 1,810-22 feet. It was plugged back from a total depth of 3,092 feet to 1,322 feet and completed making about 20,000,000 feet. The structure which is apparently proven by this discovery well will receive immediate attention.

Duval Led in Completions

Duval County again led the Laredo district and entire Southwest Texas in the volume of completions. The Loma Novia field gained 12 new producers and the Seven Sisters field five. In addition to the large drilling programs in these two fields, the smaller proven areas of the county are also seeing activity. Altogether, rigs are drilling in 10 fields in Duval County.

Three fields in Webb County are being drilled. In Lopez on the eastern edge of the county, three new producers were completed. The O'Hern field to the south gained five while the single Cole field test was abandoned dry.

In Zapata County the week marked entry of two new operators in the Haynes or Comitas field, and the Escobas field received another set-back with a failure. Although producers in these areas are completed for small initials, drilling has been steadily carried out for a long time. The Haynes field gained a pipe line outlet during the week as the gathering system was tied into the Humble Pipe Lines trunk system at the Escobas field.

Reports of saturated chalk cores and presence of oil in the pits of Atascosa County's wildcat, Atascosa Trust No. 1 Domsch heightened expectations of another Austin Chalk field for the Fault Line zone. The test topped the chalk at 3,487 feet and is bottomed at 3,500 feet. Operators are reaming for a drill stem test. Elsewhere in the Fault Line of Southwest Texas namely, the Pearsall field of Frio County results were unimportant.

Details of completions and drilling operations will be found in the Southwest Texas section of the drilling report beginning on page 283.

Oklahoma Operations

By
DAL DALRYMPLE

SEVEN SENORA SAND WELLS ADDED TO OLYMPIC SECTOR

Exploration of Senora sand in the Olympic area of northwestern Hughes County and southwestern Okfuskee County, Oklahoma, is proving more and more attractive to operators as the limits of the producing district continue to expand. The pool was extended north into Okfuskee County several years ago, and now Senora sand production is being found still further north and west of the Bearden gas pool at the Ark Royalty Co. No. 1-A Fisher, SW SE SE section 18-10-9, which was showing as a producer in sand at 1,745 to 1,765 feet. It had not been completed, but in the Olympic pool, proper, seven producers were completed in the past week, with no failures. Five new Senora sand tests were started, all in section 1-9-8 in Okfuskee County.

Oil interest in Oklahoma veered sharply to the far west during the week as a test in the old Erick gas sector of Beckham County, a few miles east of the Texas Panhandle, showed as a probable oil producer. The Carter Oil Co. No. 1 C. V. Davidson, C NW SW section 2-9-25w, was at total depth of 3,688 feet, the last 8 feet being in Granite Wash. The hole filled with 1,250 feet of fluid in 20 minutes, consisting of one-half oil and one-half mud and water. The oil was from Granite Wash. Operators were preparing to cement 5½-inch casing preparatory to testing, and to shut off water from a higher level. Nearest oil production is in the Midway field of Wheeler County, Texas, 12 miles west.

There was much activity, both in new work and completions, throughout the state in the past week. Locations were staked or work started at 55 new tests, and 77 wells were completed. The Fitts field of Pontotoc County led with 13 completions. The Magnolia Petroleum Co. No. 1 Shelton, SW SE SW section 28-2-7, the farthest east producer at Fitts, flowed 400 bbls. of oil in the first 15 minutes after topping Wilcox sand at 4,390 feet and drilling 2 feet in the sand. It had not been completed.

Oklahoma City

Two additional producers in the Capitol extension area of the Oklahoma City field were completed, and several others were near the big pay. British-American Oil Co. and Midway Oil Co. No. 1 Burnham, SE NW SW section 23-12-3w, in Block 1 of Burnham Addition, flowed more than 300 bbls. an hour with drill pipe in the hole at 6,429 feet, total depth, but taking of potential was delayed until it was deepened a few feet.

Oklahoma County

Two more big producers were completed in the capitol extension area of the Oklahoma City field. There now are 24 producers in the extension district. Barnsdall Oil Co. and others No. 1 Banks-Geyer, SE SW SE section 15-12-3w, just north of the city limits, extended production in the capitol area one-fourth mile to the north and west. Total depth was 6,487 feet in sand. It flowed 5,122.95 bbls. in six hours of potential test. It produced 3,365.52 bbls. in the last four hours, to give it a potential of 20,139 bbls. Barnsdall Oil Co. and Fairfax Oil Co. No. 5 Bracht, SE SW SW section 23-12-3w, topped second Wilcox sand at 6,352 feet, corrected, drilled to 6,455 feet and made potential of 19,021 bbls. It was deepened to 6,513 feet and flowed 6,419 bbls. in 19 hours and 40 minutes, with drill pipe in the hole.

The following new work in Oklahoma County was reported: Skelly Oil Co. and Uscan Oil Co. No. 1 McClanahan, SE SW SW SE section 15-12-3w, cellar cemented; Skelly Oil Co. No. 1 Hare, SE NW NW NE section 22-12-3w, rigging up rotary; British-American Oil Co. and others No. 1 Alta Vista, NW SE NW SW section 23-12n-3w, cellar; same operators No. 1 Wilkinson, SE SE SW SW section 23-12n-3w, cellar; Don Oil Co. No. 1 Berlowitz, SE SW NE section 9-12n-3w, wildcat between the Oklahoma City and Britton areas, digging cellar.

Pontotoc County

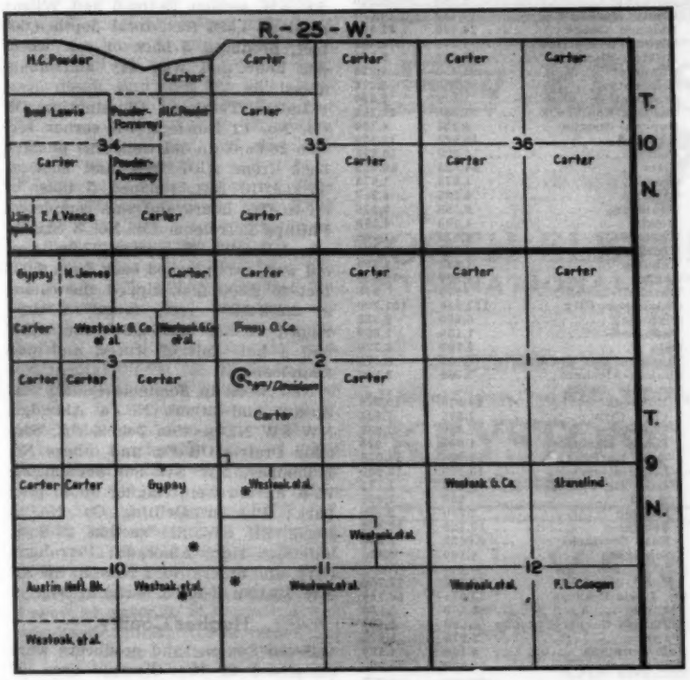
E. H. Moore and others No. 5 McCoy, SE corner section 29-2n-7e, made potential of 2,103 bbls. of oil, with 1,401,000 feet of gas and was completed. Bromide was topped at 3,915 feet, McLish 4,155 feet, total depth 4,340 feet. It was acidized with 6,000 gallons. Magnolia Petroleum Co. No. 5 Burris "A", SW SW NW section 27-2n-7e, topped Bromide at 4,000 feet, McLish 4,210 feet, and was bottomed at 4,300 feet. After acidizing with 5,000 gallons it made potential of 3,221 bbls. Gas measured 2,145,000 feet. Same operators No. 3 Metropolitan Life, NE NW SW section 27-2n-7e, was completed with potential of 3,878 bbls. at 4,280 feet, total depth, after acidizing with 8,000 bbls. Top of Bromide was 3,935 feet, McLish 4,120 feet. Same operators No. 1 Metropolitan Life, was completed at 4,275 feet, total depth, after making potential of 4,453 bbls. Bromide was topped at 3,930 feet, McLish 4,140 feet. It was acidized with 8,000 gallons and flowed 502 bbls. the first hour through casing and 168 bbls. the second hour through tubing. Same operators No. 4 Burris "B", SE SE NE section 28-2n-7e, had Bromide 3,970 feet, McLish 4,190 feet, total depth 4,295 feet. It was acidized with 8,000 gallons, flowed 579 bbls. the first hour through casing, made potential of 3,645 bbls. and was completed.

Bishop Oil Co. No. 3 Simpson SW NW NW of section 28-2n-7e, had Bromide at 4,055 feet, McLish 4,260 feet, and was completed at 4,310 feet, total depth. After acidizing with 7,000 gallons, it made potential of 2,605 bbls. at 4,100 feet. After deepening it made potential of 3,303 bbls. Fleetborn and Simpson No. 4 "A" Wooley, SW NE SE section 28-2n-7e, made potential of 4,017 bbls., after acidizing with 8,000 bbls., and was completed at 4,285 feet, total depth. Bromide was topped at 3,830 feet, McLish 4,035 feet, Dense 4,280 feet. E. H. Moore and others No. 4 Mack, NE SW SE section 28-2n-7e, had Bromide at 3,870 feet, McLish 4,045 feet, and was bottomed at 4,278 feet. It made potential of 2,886 bbls., and was completed. Same operators No. 7 Mack, NW SE SE section 28-2n-7e, drilled to 4,270 feet, total depth, acidized with 8,000 gallons, made potential of 2,111 bbls., and was completed. Top of Bromide was 3,860 feet, McLish 4,055 feet. Skelly Oil Co. No. 8 Park College, NE SW NE section 28-2n-7e, made potential of 5,337 bbls. of oil and was completed at 4,300 feet, total depth. It had Bromide at 3,960 feet, McLish 4,170 feet. It was treated with 10,000 gallons of acid and flowed 934 bbls., in five hours through tubing. Same operators No. 9 Park College, SE NW NE section 28-2n-7e, had Bromide at 4,015 feet, McLish 4,245 feet, total depth 4,306 feet. It was acidized with 10,000 gallons, flowed 915 bbls., gross through tubing in five hours, made potential of 4,077 bbls., and was completed. Fleetborn and Simpson No. 6 Wooley, NW NW SW section 27-2n-7e, made potential of 4,416 bbls., and was completed at 4,276 feet, total depth. Bromide was topped at 3,900 feet, McLish 4,110 feet. The Carter Oil Co. No. 7 Richards, SW NE SE section 30-2n-7, an old well, was deepened from 4,182 feet, to the basal sand at 4,503-4,509 feet, total depth and encountered salt water. It was plugged back to 4,410 feet, flowed 503 bbls., in six hours, through tubing.

In the Jessie area, Continental Oil Co. No. 1 Alva James, made potential of 3,015 bbls., after shooting, and acidizing and was completed at 4,743 feet, total depth. McLish, the producing horizon, was topped at 4,573 feet. It flowed 1,038 bbls., in the first four and one-half hours after acidizing. Gas gauged 1,620,000 feet.

Clark and Cowden and Delaney No. 1 Brown, SE SE NE section 12-4n-7, in the East Ada district, was bottomed at 1,951 feet, shot with five quarts, pumped 12 bbls. in 24 hours and was completed. Larson & Small Oil Co., No. 1-A Robinson, NW SW SE section 23-5n-8e, in the Allen district, pumped 5 bbls. in 24 hours after a shot and was completed at 803 feet, total depth.

New work in Pontotoc County fol-



Carter Oil Co. may open an oil pool in this Beckham County, Okla., area with No. 1 Davidson, NW SW section 2-9-25w

(Mid-Continent Map Co., Tulsa, Okla.)

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lows: E. H. Moore and others No. 10-A Wirick, SW SE SW section 29-2n-7e, spudded; same operators No. 1-A Benton, NW NE NW section 32-2n-7e, location; J. E. Crosbie, Inc., No. 1-B Harden, NW SE NE section 30-2n-7e, cellar; Magnolia Petroleum Co. No. 10, Metropolitan Life, NW NW NE section 27-2n-7e, building rig. Same operators No. 5 Burris "B", NE SE NE section 28-2n-7e, rig; same operators No. 10 Simpson, SE NE NE section 29-2n-7e, cellar and pits; same operators No. 2 Norris, SE SW SE section 21-2n-7e, rig; Clark & Cowden No. 6, Summers, SW SW NE section 17-2n-7e, drilling at 753 feet; Southard & Miller No. 1 Wilson, NW SE SW section 26-4n-5e, rig.

Estimated Production

Estimated daily average production of Oklahoma for the week ending May 9 and for the preceding week is as follows:

	Barrels	
	May 9	May 2
Allen	7,800	7,875
Asher-West Asher	825	900
Burbank	7,750	7,750
South Burbank	14,750	14,800
Balance Osage	24,000	23,800
Blackwell district	4,500	4,450
Bristow-Slick	8,750	8,500
Chandler	4,250	4,225
Crescent	5,250	5,275
Cromwell	3,875	3,800
Cushing-Shamrock	11,650	11,750
Duncan district	4,225	4,150
Edmond	10,925	13,425
Fish	10,300	10,275
Fitts	54,625	52,675
Gray	1,575	1,675
Graham	4,225	4,250
Healdton	9,350	9,275
Hewitt	4,500	4,550
Holdenville	1,075	1,100
Keokuk	3,825	4,275
Konawa	1,825	1,800
Lucien	13,500	13,250
Marshall-Lovell	975	975
Oklahoma City	127,950	121,200
Olympic	6,650	6,525
Papoose	1,150	1,050
Polo	3,700	3,725
Sasakwa and townsite	4,000	3,375
Sholem-Alechem	3,750	3,800
Seminole field:		
Bowlegs	14,075	13,975
Carr City	7,275	7,325
Earlsboro	7,650	7,650
South Earlsboro	1,000	925
East Earlsboro	10,925	11,075
Little River	13,275	12,950
East Little River	1,200	1,175
Maud	950	1,000
Mission	2,100	2,400
Seminole	10,825	10,900
East Seminole	2,6625	2,350
Searight	4,800	4,925
Total Seminole	76,700	77,750
St. Louis-Pearson	25,975	26,150
Tatums	3,500	3,500
Tonkawa-Garber-Thomas	5,500	5,500
Wewoka	3,975	3,825
Yale-Jennings	4,150	4,100
Other pools	56,500	55,000
Total Oklahoma	527,825	532,000

Seminole County

Carter Oil Co. and others No. 1 Anderson, C-28, C E half SW SW section 2-10n-6, in the Keokuk area of Seminole County, made potential of 600 bbls., and was completed at 4,193 feet, total depth, in Hunton lime topped at 4,190 feet. Misener sand, the producing horizon, was topped at 4,177 feet. J. D. Campbell No. 1 Toche, SW SE SE section 8-9n-7, in the East Seminole area, topped Cromwell sand at 3,452 feet, drilled 2 feet in, flowed 453 bbls. in 24 hours and was completed.

Fleetborn Oil Co. and others No. 1 Patton, NW NW SW section 18-6n-8, in the Sasakwa district, topped Gilcrease sand at 2,796 feet, was bottomed at 2,840 feet, shot with 15 quarts, swabbed 317 bbls., in 24 hours and was completed. Vierson-Harris and Roodhouse No. 2 Jones-Harjo, NW SE NW section 11-6n-6, pumped 32 bbls. in 24 hours and was completed at 2,460 feet, total depth after a shot. Sand was topped at 2,425 feet. Lake Oil Co. No. 1 Harjo, NE NW SW section 13-6n-5, had salt water at 3,972 feet, total depth and was dry and abandoned. Simpson dolomite was topped at 3,805 feet, first Wilcox 3,883 feet, and second Wilcox 3,965 feet. It had shows of oil in Simpson dense, topped at 3,746 feet. Lynch Drilling Co. No. 2 Hall, SW NE SW section 19-5n-6, in the Wetley area, topped the Hunton lime at 2,358 feet, drilled to 2,548 feet, total depth and top of Sylvan, was acidized and flowed 203 bbls. in 13 hours, completed. Sinclair Prairie Oil Co. and others No. 1 Harrison, SE NE NW section 17-8n-8, a wildcat, was dry and abandoned at 4,290 feet, total depth.

First Wilcox sand was topped at 4,245 feet, second Wilcox at 4,270 feet. Imperial Drilling Co. had better success with another Seminole County wildcat. The No. 1 Aldridge, SW NE NW section 32-9n-8, had Calvin sand at 1,869 feet, total depth 1,907 feet, water intruded and it was plugged back to 1,900 feet, was shot with 30 quarts, produced 6,000,000 feet of gas and was completed. Carter Oil Co. No. 1 Combs, C E half SE NW section 19-10n-6 had Wilcox sand at 4,586 feet, total depth 4,600 feet, produced 5 bbls. of salt water per hour and was dry and abandoned.

Indian Territory Illuminating Oil Co. No. 12 Bowlegs, SE corner section 26-9n-6, an old well, was plugged back from 4,107 feet, and shot at 3,900-3,916 feet, pumped 5 bbls. of oil in five hours and was completed. Phillips Petroleum Co. No. 3 Strothers, NE SW SE section 27-9n-6, an old well, was plugged back from 4,038 feet to 2,300 feet, ripped the casing at 2,289-2,297 feet, found it dry; ripped casing 2,275-2,290 feet, and had a hole full of water, and was abandoned.

New work in Seminole County: Al Spears and others No. 4 Aldridge, NW SW NE section 7-6n-8, rig; Sinclair Prairie Oil Co. and others No. 1 Pompey, NW SW SW section 24-7n-6, an old well, rigging up to plug back; Pioneer Drilling Co. No. 2 Reed, SE SW SE section 27-8n-8, building rig; Amerada Petroleum Corp. and others No. 1 Newell, SE SE NW section 3-10n-5, building rig.

Hughes County

Seven Sonora sand producers were completed in the Olympic area of Northwestern Hughes County. G. A. Manahan and others No. 2 Oliphant "E", NE SE NW section 1-9n-8, topped Sonora sand at 1,656 feet, drilled to 1,715 feet, was shot with 60 quarts, flowed 423 bbls., in 12 hours and was completed. Same operators No. 3 Oliphant "E", SW SE NW section 1-9n-8, flowed 150 bbls. in three hours after a 60-quart shot and was completed at 1,716 feet, Sonora sand was topped at 1,669 feet. Same operators No. 4 Oliphant "E", NW SW NW section 1-9n-8, had the sand at 1,666 feet, was bottomed at 1,710 feet, shot with 60 quarts, and flowed 159 bbls., in three hours. Carter Oil Co. No. 4 Hampton, SW SE NE section 1-9n-8, had the sand at 1,657 feet, was bottomed at 1,707 feet, shot with 65 quarts, flowed 240 bbls. in 11 hours and was completed. Sinclair Prairie Oil Co. No. 10 Oliphant, NE NE SE section 1-9n-8, flowed 420 bbls. in 21 hours after a shot, and was completed at 1,698 feet, total depth. Sonora sand was topped at 1,639 feet. Amerada Petroleum Corp. and Stanolind Oil & Gas Co. No. 1 Kirby, NW corner section 6-9n-9, topped Sonora sand at

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1,682 feet, total depth 1,745 feet, was shot with 80 quarts and flowed 107 bbls. in 21 hours through casing and tubing. It later flowed 119 bbls. in 24 hours through tubing and was completed.

Saco Oil Co. No. 4 Oliphant, SE NE SW section 12-9n-8, topped the sand at 1,734 feet, was bottomed at 1,771 feet, was shot with 40 quarts and flowed 77 bbls. in 13 hours.

In the Papoose area, Kingwood Oil Co. and Phillips Petroleum Co. No. 7 Rogers, C E half SW SW section 3-9n-9, topped Calvin sand at 1,079 feet, drilled to 1,096 feet, total depth, shot with 20 quarts, pumped 15 bbls. in 24 hours and was completed.

The following new operations were reported in Hughes County: J. A. Chapman No. 3 fee, SW NE NW section 1-9n-8, set 10-inch casing at 40 feet; Carter Oil Co. No. 6 Hampton, NW SE NE section 1-9n-8, set 10-inch casing at 43 feet, and was waiting on cement at 150 feet; same operators No. 7 Hampton, SE NE NE section 1-9n-8, spudded; same operators No. 8 Hampton, NE SE NE section 1-9n-8, location; Sinclair Prairie Oil Co. No. 11 Oliphant, SE NE SE section 1-9n-8, cellar and pits; same operators No. 7 Foster, NE NW NW section 33-8n-8, an old well, rigging up to deepen.

Cleveland County

Sinclair Prairie Oil Co. and others No. 1 Franklin, SE NW SE section 21-10n-2w, Cleveland County, an old well, was rigging up to drill deeper. This was the discovery well in the Moore area and was originally completed as a big gasser.

Pottawatomie County

Hilton Phillips No. 2 Bettis, NW SE SW section 21-7n-4, in Pottawatomie County, topped Viola lime at 4,010 feet; had the pay at 4,145 feet, 4,150 feet total depth, was acidized with 2,000 gallons, pumped 640 bbls. of oil and 50 bbls. of water in 24 hours and was completed. Helmerich & Payne No. 1-A Bettis, C N half SE SE section 18-7n-4, topped Hunton lime at 3,724 feet; Sylvan shale 4,242 feet, total depth 4,244 feet; was plugged back to 4,135 feet, and shot without results. tI was plugged back to 3,825 feet, was acidized and swabbed 40 bbls. of oil net in eight hours. Later it pumped 40 bbls. in 24 hours and 12 bbls. in the next 24 hours and was completed.

Maebris No. 2 Sullivan, NE NW NW section 34-7n-4, topped Viola at 4,195 feet, had the pay at 4,289 feet, and was bottomed at 4,292 feet. After acidizing it pumped 30 bbls. of oil and 5 bbls. of water net in 24 hours. Phillips Petroleum Co. No. 1 LeClair, SW NW NE section 23-7n-4, an old well, was plugged back from 4,334 feet, to 4,075 feet, and was shot at 3,928-3,938 feet, and at 3,935-3,940 feet, and flowed 321 bbls. in the first 10 hours. Later it was acidized and flowed 643 bbls. net in 24 hours and was completed.

Magnolia Petroleum Co. No. 6 Brandenburg, NW corner section 18-7n-5, an old well, was deepened from 3,953 feet to 4,078 feet, and swabbed 1,400 bbls. in 24 hours. Later on gas lift it flowed 2,432 bbls. in 24 hours. Wilcox sand was topped at 4,064 feet. Conley Drilling Co. No. 2 Vinson, SW NE NE section 13-7n-4, an old well, was deepened from 4,072 feet to 4,076 feet, and pumped 600 bbls. in 24 hours. Completed.

New work in Pottawatomie County: E. Halliburton No. 2 Pierson, SE SE NE section 9-7n-4, rigging up to plug back; Elbar Oil Co. No. 2 Wyatt, SW NW NW section 10-7n-4, old well drilling deeper, fishing at 3,928 feet; Phillips Petroleum Co. No. 2 Duff, NW NW SW section 10-7n-4, an old well plugged back from 3,998 feet to 3,580 feet, and shot at 3,500-10 feet, had 1,200 feet of oil in the hole and was cleaning out.

Blackwell Oil & Gas Co. No. 2 Waylahpease, SW NW SW section 7-9n-5, an old well, rigging up to deepen; Stanolind Oil & Gas Co. and Amerada Petroleum Corp. No. 2, Goodman, NW NW NE section 5-10n-4, location.

Osage County

Champlin Refining Co. No. 3 Maker, NW SW NE section 15-25n-6, in Osage County, topped Bartlesville sand at 2,770 feet, and was bottomed at 2,800 feet. The potentials of Nos. 2 and 3 Maker were taken together, the two wells making a combined potential of 325 bbls. Production of No. 2 was estimated at 124 bbls., and No. 3 at 201 bbls. Comail Oil Co. No. 11 Osage, NW SE SW section 32-22n-8, topped Bartlesville sand at 2,245 feet, and had a showing of oil, but it had a hole full of water at 2,325 feet, total depth, and was dry and abandoned. Pure Oil Co. and others No. 103 Osage, NW NW SW SE section 9-23n-8, was acidized and shot and pumped 20 bbls. of oil and 3 bbls. of water in 24 hours, completed. This was an old well deepened from 2,302 feet to 2,433 feet, total depth. Chert was had at 2,323-2,425 feet.

Bay Oil Co. and F. W. Files No. 5-A Osage, NE SW NW section 19-23n-9, was dry and abandoned in Siliceous lime at 2,622-2,631 feet, total depth. Lewis Production Co. and Continental Oil Co. No. 13 Ke-ne-kah, NW SW SW section 16-24n-7, flowed 285 bbls. in 24 hours after a shot at 2,629-2,644 feet, and was completed. It topped Bartlesville sand at 2,619 feet, drilled to 2,649 feet, and plugged back to 2,644 feet. Sinclair Prairie Oil Co. No. 13 Osage, SE NW SW section 30-25n-8 topped Mississippi lime at 2,370 feet, had the pay at 2,384 feet, and was bottomed at 2,404 feet. It pumped 14 bbls. of oil with a show of water in 24 hours and was completed. Philtex No. 12 Osage, NE NW SW section 22-25n-12, had Bartlesville sand at 1,378 feet, was dry at 1,498 feet, total depth, and was completed as a repressure well.

The following new work was started in Osage County: Lewis Production Co. and Continental Oil Co. No. 10 Ah-ke-me, SE NW SE section 9-24n-7, a rig; same operators No. 11 Ah-ka-me, SW NE SE section 9-24n-7, building rig; same operators No. 12 Ah-ka-me, SE NE SE section 9-24n-7, a cellar; Lewis Production Co., Texas Co. and Continental Oil Co. No. 2 Barker, NW SW NW section 10-24n-7, location; Lewis Production Co. No. 5 Whitehorn, SW NW NW section 10-24n-7, cellar; Sinclair Prairie Oil Co. No. 6 Osage, NW NW NE section 16-25n-6, cellar.

Kewanee Oil & Gas Co. No. 5 Hale, NE NE SE section 27-26n-6, building rig; Philtex Oil Co. No. 13-C Osage, SW SW SE NW section 22-25n-12, location.

Noble County

Tide Water Oil Co. No. 1-A O'Neil, SE SW NE section 16-23-2w, in Noble County, had Arbuckle lime at 4,530 feet, and produced 10 bbls. of water per hour at 4,534-35 feet, total depth. It was plugged back to 3,575

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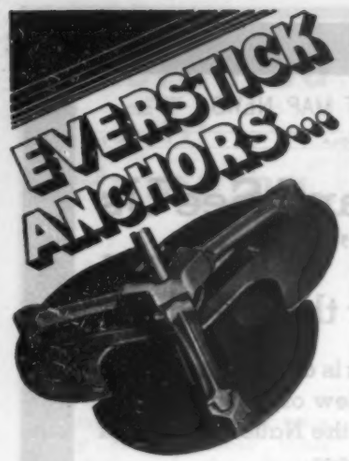

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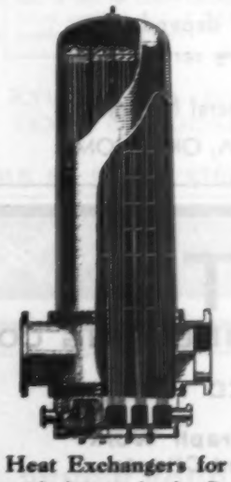

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feet, ripped pipe at 3,498-3,500 feet, had a hole full of water and was abandoned. This well is about 1 mile north of new Wilcox sand production in the Billings pool.

Kay County

Kansas-Oklahoma Gas Co. No. 1-A Rinehart, C SE NW section 21-29n-1, in Kay County, had gas showing in lime at 788-90 feet, produced 84,000 feet of gas and was completed at 815 feet, total depth. It had a hole full of water at 710 feet.

Logan County

Stanolind Oil & Gas Co. and Amerada Petroleum Corp. No. 4 Pfeiffer, C S½ S½ SW¼ section 33-20n-2w, was a rig.

Pawnee County

J. L. Reynolds No. 1-A Dawning, NW NW SE section 24-20-8, in the Lauderdale area of Pawnee County, had Layton sand at 1,110-19 feet, was shot there, pumped 25 bbls. of oil in 24 hours and was completed at 1,123 feet, total depth.

New work in Pawnee County: Shell Petroleum Corp. No. 17 Miller C NE NE section 19-21n-8, spudded; Peter Adamson Jr. No. 3 Parker, SW SE SE section 24-21-7, an old well, was cleaning out to deepen.

Payne County

Stanolind Oil & Gas Co. and Amerada Petroleum Corp. No. 1 Pratt SE corner section 29-19-5, a wildcat east of the Ingalls pool in Payne County, was a cellar.

Lincoln County

Mid-Continent Petroleum Corp. and Texas Co. No. 1 Hillman, SW SE NE section 29-13-6, in Lincoln County, was building a rig.

Creek County

Giblin and others No. 2 Vance, NW SW SW section 6-18-7, in Creek County, topped Bartlesville sand at 2,519 feet, total depth 2,576 feet, swabbed 118 bbls. of oil, completed. Shaw, Doak and Hughes No. 1 Yarhola, NW NW NE section 25-17-7, topped Bartlesville sand at 2,789-2,813 feet, total depth 2,815 feet, produced an estimated 4,240,000 feet of gas, completed. Bay State Oil Co. No. 1 Buckner, NE NW NE section 9-17-8, had Layton sand at 1,420-55 feet, and was abandoned at 1,462 feet, total depth.

O. O. Owens and Bay State Oil Co. No. 2 Atterbury, NW SW SW section 10-17-8, topped Cleveland sand at 1,805 feet, and was abandoned at 1,875 feet, total depth. Sinclair Prairie Oil Co. No. 18 Mickey, NE SE SE section 33-18-7, was bottomed at 2,708 feet and abandoned there.

New work in Creek County was as follows: L. B. Jackson No. 2 Noland "A", SE NE NE section 2-17-8, location; Shaw, Doak & Hughes No. 1 White, SE SE SW section 24-17-7, cellar; Shamblin and others No. 1 Abraham, NE SW SE section 21-15-8, location; Sparton No. 1 Marrison, SE NW NW section 8-18-11, location; Grant No. 8 White, NE SW NE section 19-17-11, location; Big Four Petroleum Co. No. 1-B Evans, NW NW SE section 31-19-9, machine; Commercial Drilling Co. No. 6 Saab, NE NW SW section 17-19-9, drilling at 300 feet; Swift and others No. 2 Coonrod, SW SW NW section 3-19-9, machine.

Saco Oil Co. No. 3 Leader, NE SE SW section 15-18-8, digging cellar; L. B. Jackson No. 3 Noland "A", NE corner section 2-17-8, location; Sinclair Prairie Oil Co. No. 5 Jones, SE SE NW section 4-17-7, an old well being deepened, topped Simpson sand at 2,771 feet, had show of water and was to plug back; Royal Oil & Gas Co. No. 9 Knoll, C NE SW section 22-16-8, an old well to be deepened, cleaning out; Riverland Oil Co. No. 1-A Burgess, SW corner section 32-15-9, total depth 1,274 feet, to shoot; Tibbins Estate No. 7 Sneed, NE NE NW section 18-14-9, machine.

Tulsa County

Sand Springs Home No. 1 Thlacco, SW SW NW section 2-19-11, in Tulsa County, had sand at 2,455 to 2,457 feet, total depth, and was dry and abandoned.

The following new work was reported in Tulsa County: Gilmort Oil Co. No. 1-A Clinton, SE SW SE section 32-19-12, topped Mississippi chat at 1,775 feet, and was drilling at 1,845 feet; Cummings No. 6 Bunger, CNL S half SW NW section 27-17-13, rigging up.

Okmulgee County

Wolf and others No. 1-A West, NW corner section 34-15-11 in Okmulgee County, topped Wilcox sand at 2,832 feet, total depth 2,857 feet, swabbed 50 bbls. of oil and was completed. Penrod and others No. 1-A Doyle, SE NE SW section 15-13-14, topped sand at 1,624 feet, total depth 2,770 feet; plugged back to 1,925 feet and pumped 4 bbls. of oil daily. W. B. Pine No. 1-A Beams, C S half NE section 4-15-14, topped sand at 1,580 feet, and was dry and abandoned at 1,645 feet, total depth. Aggis Drilling Co. No. 1-B McKinney, C SW NW section 16-15-14, was abandoned at 872 feet, total depth. F. D. Misener No. 4 Larney, SE SW NE section 28-15-14, was abandoned at 677 feet, total depth. Downing No. 1-A Anderson, SE corner section 36-16-14, had sand at 1,253-75 feet; total depth 1,290 feet; was shot with 50 quarts and pumped 4 bbls. of oil in 24 hours. Acme No. 3 Rentie, NW NW SW section 19-14-15, topped Booch sand at 1,131 feet, total depth 1,170 feet, pumped 5 bbls. of oil daily and was completed. Cusack No. 1 Reading, NE corner section 36-15-12, had Wilcox sand at 2,750-65 feet, total depth, and was dry and abandoned.

The following new work was reported in Okmulgee County: Bailey No. 1 Thompson, NW SW NW section 9-15-11, location; American-Maracaibo Oil Co. No. 3 Bullett, NE SW NE section 27-12-12, location; Logan and others No. 1-A Bennett, NE SW NW section 35-16-11, location.

Klingensmith No. 10 Farr, SW SE NW section 35-16-11, rigging up; same operators No. 15 Farr, NW NE NW section 35-16-1, rigging up; Acme No. 4 Rentie, NE NW SW section 19-14-15, cleaning out at 1,225 feet, total depth; English Drilling Co. and Hendricks No. 4 Colbert, SE NW NE section 15-14-14, location.

Muskogee County

Naphen & Jarrett No. 2 Fluche NE NE SW section 17-14-17, in Muskogee County, topped sand at 1,874 feet, total depth 1,886 feet, was acidized and flowed 52 bbls. of oil in 24 hours, completed.

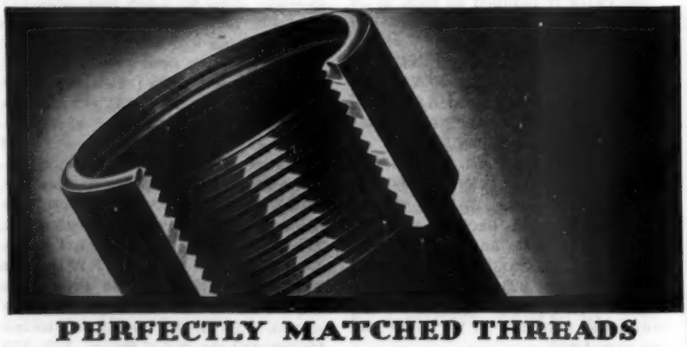
New operations in Muskogee County: Garrett No. 1 Gilbray, SE NW NE section 13-13-15, rig; Naphen No. 3 Fluche, NE NE SW section 17-14-17, machine; Lightner No. 1-A Sugar, NW NW NE section 19-14-16, machine; Feenburg No. 15 Cherry, SE NW SW section 17-14-16, set 10-inch casing at 137 feet and was waiting.

Carter County

Simpson-Fell Oil Co. No. 1 Byrd, SW cor. section 4-2s-2w, in the Wildcat Jim area of Carter County, was completed at 1,389 feet, total depth. It flowed 335 bbls. of oil naturally in 24 hours and 945 bbls. on air lift. It had Conglomerate at 1,307-81 feet. Same operator's No. 1 Akers, NE SE NE section 5-2s-2w, drilled to 1,707 feet, total depth; plugged back to 1,513 feet, produced 4 bbls. of oil in 24 hours and was completed. It had sand at 1,495 to 1,513 feet.

Sinclair Prairie Oil Co. completed the No. 22 Million & Thomas, NW SW SE section 5-4s-3w, the old well that caused considerable excitement several weeks ago when it discovered Ordovician pay in the Healdton field. After drilling to 3,183 feet, total depth, it was plugged back to 3,131 feet, but failed to respond satisfactorily to acid treatment. It then was plugged back to 3,135 feet and was

(Continued on Page 282)



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Eastern Field Report

ORISKANY SAND TESTS HOLD INTEREST IN WEST VIRGINIA

By STAFF CORRESPONDENT

PITTSBURGH, Pa., May 11.—The Oriskany tests in West Virginia still remain the focus of interest in the lower eastern fields. A new test along the Warfield anticline is starting. Between Mud Lick and Slab Fork of Leatherwood Creek in Big Sandy district, Kanawha County, the United Carbon Co. is building a rig at its old No. 15 on the Osborne farm to drill it down to the Oriskany sand. It was formerly a producer in the Weir sand. It is located about 1 mile west and 3½ miles south of the town of Clendenin. This is over 20 miles north and east of the present activity on the Warfield and Milliken anticlines.

In Malden district, Kanawha County, the South Penn Oil Co. completed the second test on the Katherine C. Scott farm as a gas well. The Corniferous lime extended from 4,791 to 4,888 feet and about 700,000 feet of gas was struck 4 feet in the Oriskany sand at 4,892 feet. At 4,899 feet the gas had increased to about 1,350,000 feet and the second pay had not been completely drilled through. It is located a mile east, 30 degrees north, of the No. 1 on this farm and offsets the No. 1 of the Columbian Carbon Co. on the W. D. Lewis farm which originally had a volume of 1,000,000 feet a day, naturally, which after shot increased to 8,000,000 feet a day.

In this district, the United Fuel Gas Co. has made a location for a deep test, No. 4,643, on the Georges Creek Land & Mining Co. tract on Georges Creek about a half mile due east of the Oriskany gas well on the Nellie B. Tompkins farm. It is located 990 feet southwest of the Creek and 1,060 feet from the north edge of the property line on that creek. The elevation at the mouth of the well is 769.45 feet.

In Malden district, Godfrey L. Cabot, Inc., is drilling at 4,300 feet in the test on the W. D. Lewis farm; 1,158 feet in the second test on the Nellie B. Tompkins farm and building a road to the location for a No. 3; drilling at 3,510 feet in the Campbells Creek Coal Co. No. 9 and 1,582 feet in the No. 10. This operator has also rigged up the second deep test on the William B. Tompkins farm. The United Carbon Co. has rigged up and is ready to start the test on the J. Q. Dickinson farm.

In Elk district, Kanawha County, the Columbian Carbon Co. is down 4,920 feet in deepening the test on the W. L. Burdette farm. The top of the Corniferous lime was at 4,911 feet. In the Elkland Improvement Co. test, this company has reached a depth of 4,080 feet. On the W. H. Baxter and others lease, the Columbian Carbon Co. is fishing at 4,719 feet for the bailer. The Copenhaver No. 3 improved somewhat during the week and is showing for 4,000,000 feet a day.

In this district, the Glen Oil & Gas Co. is drilling at 1,435 feet in the test on the Virginia Joint Stock Land Bank lease (Charles L. Morris farm). This is located about 3½ miles north, 1 mile east, of the Copenhaver farm. V. C. Smith and others are down 5,500 feet in deepening the test on the island at the mouth of Coopers Creek. The Newburg sand has not been identified although the depth has been reached.

In Elk district, Benedum & Trees are drilling at 1,150 feet on the Mary C. Wingfield farm and the Yoak Oil & Gas Co. is down 1,212 feet on the W. T. and J. H. Goshorn farm.

In Loudin district, the United Carbon Co. is drilling at 4,960 feet on the C. C. Dickinson farm. Godfrey L. Cabot, Inc., is down 2,310 feet in No. 2 Kanawha Land Co. lease.

Seventeen wells and four dry holes were reported in the lower eastern fields during the past week. Nine were gas wells and eight producers with an initial production of 146 bbls. a day, most of which were in Southeast Ohio.

SOUTHEAST OHIO

In Athens County, C. S. Parks and others completed a test on the James Young farm on Hamley Run in section 12, Waterloo Township, in the Devonian shale at a depth of 2,250 feet. It is a small gas well.

In Belmont County, the Union Gasoline & Oil Corp. completed a test on the J. and S. Slinwniki (mapped Elizabeth A. Hardy) farm in the NE quarter of section 25, Richland Township. It is a good gas well in the First Cow Run sand at 819 feet and gauges 1,250,000 feet a day.

In Coshocton County, there were two shallow completions. In Clarke Township, M. C. Waltz completed No. 10 on the J. B. Lawrence farm in the Berea sand at 810 feet. It is a small producer good for about a half barrel a day and is located among old production. In section 10, Mill Creek Township, the Ohio Gas Light & Coke Co. completed No. 3 on the L. Storm farm in the Berea sand at a depth of 980 feet. It is a small gas well gauging 135,000 feet a day and had no showing of oil.

In Hocking County, the Preston Oil Co. completed No. 1,597 on the Sunday Creek Coal Co. tract in the SE quarter of section 6, Ward Township. It was drilled through the Clinton sand to a depth of 3,545 feet and there was no showing of oil or gas.

In Licking County, there was one fair producer. The Edward H. Everett Co. completed a test on the Amy F. Nethers farm in the SW quarter of section 19, Hanover Township, at a total depth of 3,032 feet, the Clinton sand. It produced 95 bbls. the first day after shot.

In Medina County, the Oko Oil & Gas Co. completed No. 45 on the Sanford and Watson lease, Tract 10, Lot 3, Chatham Township, in the Berea grit at 403 feet. It produced 1 bbl. the first day after shot.

In Perry County, the Kachelmacher estate completed No. 12 on the Hemlock Coal Co. lease in the SW quarter of section 30, Monroe Township, in the Clinton sand at a depth of 3,618 feet. It produced 25 bbls. the first day after shot and is located about 800 feet east of No. 11 on this lease.

In Washington County, E. A. Metcalf completed No. 12 on the Louis Jefferson farm in the Little Muskingum Valley at Marietta, section 4, in the Second Cow Run sand at 914 feet. Though having a light showing naturally, after shot, it produced 4 bbls. the first day.

SOUTHWEST PENNSYLVANIA

A producer, a gas well, and one dry hole were added to the Southwest Pennsylvania totals. In Amwell Township, along the Fifth sand streak, the Union Gasoline & Oil Corp. completed a well on the Thomas Beabout farm at a total depth of 3,121 feet. It is showing for about 7 bbls. a day, which is small for this pool.

In Franklin Township, Greene County, the Waynesburg Home Gas Co. completed deepening No. 1 on the W. F. Guthrie farm in Franklin Township at 2,923 feet. The Fifty-foot sand was at 2,329-92 feet with about 94,000 feet of gas at 2,347 feet which soon blew down to 11,000 feet. The Gordon sand was at 2,530-68 feet with 68,000 feet of gas at 2,551 feet. The Bayard sand was at 2,855-60 feet with 94,000 feet of gas at 2,858 feet.

In Cecil Township, Washington County, the test of G. N. Glass and others on the F. W. McEwen farm was dry in the Fifth sand at a total depth of 2,650 feet.

In Amwell Township, Washington County, A. V. Lewis and others are building a rig on the Charles Brunder farm. The same operators have made a location for a second test on the Anna Phelan farm, and one on the W. Dodd farm. The Union Gasoline & Oil Corp. is down 1,910 feet on the Marion C. and Nettie Johnson tract (H. VanKirk). The South Penn Oil Co. has reached 1,580 feet on the Anna A. Lowery farm; 640 feet on J. Q. Zimmerman farm and has spudded in and started drilling to test the Hazel M. Seese farm.

In Morris Township, Washington County, the New Oil & Gas Co. is drilling on the D. L. McVey farm at 2,085 feet. The Big Injun sand was at 2,001 feet and 6⅝-inch casing was set to 2,004 feet.

In South Franklin Township, Washington County, the Carnegie Natural Gas Co. is spudding in on the Belle A. Jones farm. In East Finley Township, the Natural Gas Co. of West Virginia has started drilling on the J. R. and Lillian Day 80-acre farm, near East Finley.

In Greene County, the Carnegie Natural Gas Co. is building a road to a location on the W. R. Kincaid farm in Richhill Township. In Center Township, this company has made a location on the J. W. Milliken farm.

In New Freeport, the Equitable Gas Co. is drilling at 2,990 feet on the Fannie Berdine farm. The Stray sand was at 2,965-78 feet, with about 61,000 feet of gas showing at 2,975 feet. In Richhill Township, the Natural Gas Co. of West Virginia is down 2,233 feet in deepening the test on the Braddock farm. In Center Township, the South Penn Oil Co. has reached 1,630 feet on the Charles T. Harvey farm. Ten-inch casing was set to 1,425 feet.

Deep Tests

The deep test of Norwood Johnston and others on the James McBurney farm south of Hickory in Pleasant Township, Washington County, is drilling below 2,700 feet.

Very little progress was made in the deep test of William Snee and others on the Summit Hotel property on Chestnut Ridge in South Union Township, Fayette County. Difficulty was encountered by the line rubbing at the point where the string of tools were lost around 4,100 feet and cemented in and drilled by. The casing was cut and rerun and the test is ready to resume at 6,270 feet.

WEST VIRGINIA

In Clay County, the Virginian Gasoline & Oil Corp. completed No. 34 Brown, Swan, Goshorn & Geary tract, in Henry district in the Injun sand at 1,994 feet. It is showing for 12 bbls. a day.

In Pleasants County, Tate & Patterson completed No. 4 on the J. W. Hinds farm in Washington district in the Maxon sand at a depth of 1,473 feet. It is good for 1 bbl. a day along with about 37,000 feet of gas.

Gas Wells

In Clay County, the Elk River Gas Co. completed a test on the Thompson Land & Coal Co. tract in Pleasant district as a gas well gauging 1,332,000 feet a day at a total depth of 2,426 feet. The Big Lime was at 2,240-2,380 feet; the Big Injun sand at 2,380-2,424 feet with gas at 2,390-2,400 feet and again at 2,408-24 feet.

In Lincoln County, the United Fuel Gas Co. completed No. 4,606 on the James M. Egnor farm in Union district as a gas well. Here the Big lime was at 1,747-1,940 feet; gas at 1,875-80 feet; the Big Injun sand at 1,995-2,035 feet; the Berea sand at 2,436-60 feet with gas at 2,438-42 feet. The total gas gauges 82,000 feet.

In Ritchie County, Mosser & Collins completed a test on the Ada Hor-

ner farm in Murphy district at a depth of 2,100 feet. It is a small gas well gauging 149,000 feet a day from both the Maxon and Injun sands. In Grant district, E. S. Gilmore and others drilled a test on the Albert Metz farm through the Squaw sand to a depth of 1,945 feet and it was a dry hole.

In Upshur County, an important test proved dry. The Columbian Carbon Co. drilled a test on the W. H. Reger farm in Warren district to a total depth of 4,565 feet without finding a commercial pay. The Benson or gas sand in this area was at 4,341-43 feet.

In Wayne County, the Ceredo Gas & Development Co. drilled a test on its own property in Ceredo district to a depth of 2,461 feet and completed it as a gas well, gauging 106,176 feet a day. The Big Lime was at 805-930 feet; the Big Injun sand at 970-979 feet; the Berea sand at 1,540-80 feet; the Brown shale at 1,652-2,325 feet, with the gas at 2,170-2,315 feet.

Other Operations

In Boone County, the United Fuel Gas Co. is spudding No. 4,619 on the Mohler Lumber Co. lease in Scott district. In this district, the Owens Illinois Glass Co. is down 981 feet in the No. 3 Mamie Ballard and others. In Sherman district, the same company is building a road for No. 26 on the Peytonia Coal Land Co. lease and drilling at 947 feet in No. 27. In Washington district, O. B. Cunningham is rigged on the J. H. Perdew farm.

In Cabell County, Adkins and McComas are rigging up on Caldwell heirs farm in McComas district. The Shale Gas Co. is rigging up on the A. S. Hatfield farm. In Grant district, the Thermal Gas Co. is spudding on the T. H. Perry farm and the Shale Gas Co. is down 2,425 feet in a second test on the Charles Morrison farm. In Union district, the Sure Shot Torpedo Co. is drilling at 2,000 feet on its own property. In Guyandotte district, the Eureka Gas Co. is down 2,695 feet on the Hans-Watts Realty Co. lease.

In Fayette County, Godfrey L. Cabot, Inc., has started drilling No. 7 Kanawha Gauley Coal Co. lease in Falls district. In Gilmer County, H. B. Scott is rigged up on the Doy McClain farm.

In Kanawha County, the United Fuel Gas Co. has made a location for No. 4,628 Louisa D. Updegraff on Falling Rock Creek in Big Sandy district. The elevation at the mouth of the well is 850 feet. In Elk district, this company has made a location for No. 14 on the King Land Co. on Falling Rock Creek. This elevation is 1,215 feet. In Cabin Creek district, the Pure Oil Co. is drilling two wells on the Williams Coal Co. lease, the No. 262 at 2,524 feet and the No. 262 at 2,147 feet.

In Lincoln County, the United Fuel Gas Co. has made two more locations for wells on the Horse Creek Land & Mining Co. tract in Duval district. The No. 4,626 is on Bear Fork of Horse Creek and the No. 4,625 is on Peter Cave of the same stream.

In Marion County, the Hope Gas Co. is setting rig timbers for No. 7,737 on the Jacob Rice farm on Robinson Run in Paw Paw district. In Lincoln district, Victor E. Tennant is building rig on the Mrs. E. Kuhn farm.

In Monogalia County, the Hope Construction & Refining Co. is grading a road for No. 7,741 on the C. L. Eakin farm on Dunkard Creek in Battelle district. In this district, this company is drilling deeper the No. 570 on the Henry S. Shriver farm.

In Roane County, L. C. Young and others have made a location on the W. R. Harper farm in Harper district. In Curtis district the Henderson Oil Co. has made a location for a test on the L. C. Burdette farm.

In Marshall County, the Valley Run Oil & Gas Co. is building rig on the C. Yoho farm in Liberty district. In this district the Manufacturers Light & Heat Co. is down 780 feet on the V. B. Pyles farm.

In Tyler County, the Hope Construction & Refining Co. is building rig on the Charles B. Booher farm on Indian Creek in McElroy district.

Oklahoma Fields

(Continued from Page 280)

completed, pumping at the rate of 15 bbls. daily. It had produced as high as 90 bbls. in one day. Viola lime was topped at 970 feet; Bromide, 2,005 feet; Bird's Eye, 2,955 feet.

Shell Petroleum Corp. No. 67 Wirt Franklin, SE SW NE section 8-4s-3w, had sand at 1,034-50 feet, total depth, pumped 19 bbls. in 24 hours and was completed. Southern States Oil Development Co. No. 1 Ed Moore, NE SE NW section 30-4s-1w, a wildcat, had a lost string of drilling pipe and junked hole at 1,155 feet, total depth, and was abandoned. Howard Chamberlin No. 2 Johnson-McGill, SW NE SW section 17-4s-2w, had several sand series with both oil and water showing, but plugging back after drilling to 2,035 feet and was abandoned.

The following new work in Carter County was reported: Samedan Oil Co. No. 1 McKinney, NE SE SE section 5-2s-2w, was drilling at 1,320 feet; Shell Petroleum Corp. No. 68 Wirt Franklin, NE NW NE NE section 8-4s-3w, location; Sinclair Prairie Oil Co. No. 7 Apple-Franklin, SW SW NW section 9-4s-3w, was drilling with machine at 365 feet.

Marshall County

Kingston Oil Co. 4 Felts, NW NE NW section 6-8s-6e, in the Isom Springs area of Marshall County, had a junked hole and was abandoned at 276 feet, total depth.

Caddo County

Denver Producing & Refining Co. No. 1 Sah-Cam, C SE SE section 33-10-10w, second deep well to be drilled in the Binger area of Caddo County, was abandoned at 8,147 feet, after it had been bailed down 3,400 feet into salt water. It originally was drilled to 10,084 feet, total depth, but failed to make a commercial producer, had numerous drilling difficulties and started drilling in new hole below 8,000 feet, carrying it to 8,147 feet. Before starting new hole, it was swabbed below 6,000 feet and produced 200 bbls. of oil in three days. It was swabbed down and flowed 40 minutes, producing some oil but it was thought to have been part of a load used in circulating. In the Cement area, Magnolia Petroleum Co. No. 4 Sames, SW NE NE section 35-6-10w, was completed as a gas well at 6,573 feet, total depth, in shale. It produced 15,280,000 feet of gas, with rock pressure of 2,100 pounds. It had broken sand and lime at 6,490-6,505 feet.

Stephens County

Louis Sikes No. 6 Mulkey, SE NE NE section 16-1s-8w, in the Empire area of Stephens County, had sand at 2,018-32 feet; total depth, 2,040 feet; pumped 40 bbls. of oil in 24 hours and was completed. L. A. Wilkins and others No. 8 Crump, SW SW SE SE section 10-2s-5w, in the Velma area, pumped 8 bbls. of oil in 24 hours and was completed. It had sand at 783-810 feet and 851-58 feet, total depth. Raisen Brothers No. 5 Crosbie, NW SW SW SW section 23-1s-5w, pumped 3 bbls. of oil in 24 hours and was completed at 386 feet, total depth. It had sand at 376-85 feet. Same operators No. 6 Crosbie, C E half SW SW SW section 23-1s-5w, had sand at 381-88 feet, total depth, pumped 4 bbls. of oil in 24 hours and was completed.

Two new operations in Stephens County were reported. Raisen Brothers No. 7 Crosbie, NE SW SW SW section 23-1s-5w, had spudded. L. A. Wilkins and others No. 9 Crump, SW NW SE SE section 10-2s-5w, was drilling at 750 feet.

Jackson County

Gulf Oil Corp. No. 1 Shirley, NE NW NE section 6-1s-19w, in the Tipton area of Jackson County, flowed 576 bbls. of oil in 24 hours and was completed at 2,628 feet, total depth, in lime topped at 2,608 feet. Same operator's No. 4 Boucher, SE SW SW section 32-1n-19w, flowed 2,179 bbls. in 18 hours through 7-inch pipe, and at time of completion flowed 242 bbls. of oil through 2½-inch tubing in the last 24 hours. The oil was 41 gravity. It had sand at 2,654-55 feet; total depth, 2,656 feet. The success with this well revived activity in Jackson County. E. W. Linsey No. 1 Cole, SE SE NW section 34-2-20w, in the Altus area, was abandoned at 1,730 feet, total depth, in brown shale. It had dry Granite Wash at 1,330-65 feet.

One new test in Jackson County was started. Gulf Oil Corp. No. 2 Shirley, SE NW NE section 6-1s-19w, was a rig.

Bryan County

Trio Oil Co. No. 3 Gilbert, C SW section 25-8s-7, wildcat in Bryan County, was dry and abandoned at 1,200 feet, total depth, in black shale topped at 1,053 feet. It had water in Arbuckle sand at 881-900 feet.

Southwestern Oklahoma

In Beckham County, West Oak Gas Co. No. 1 Baldwin, C N half S half NE section 10-9-25w, had Anhydrite and Dolomite at 3,271-3,535 feet, total depth, produced 25,000,000 feet of gas and was completed. It based Red Beds at 1,150 feet; topped the big lime at 1,840 feet; second lime, 2,630 feet; Dolomite, 3,340 feet.

Jo-Gail Drilling Co. No. 1 Gilliland, C NE NE section 33-8-26w, wildcat southwest of Erick, the only new test in Beckham County, was a location.

In Tillman County, Gulf Oil Corp. and others No. 1 McNair, NW SW SW section 15-3s-17w, wildcat southeast of Frederick, was cellar and pits. Johnson, Young & Mitchell No. 1 Donahoe, SW NW NW section 7-4s-17w, south of Frederick and near the Red River, was drilling at 52 feet. It previously had been listed as in SE NW NW section 7-4s-17w. There were no completions in Tillman County.

In Grady County, Magnolia Petroleum Co. No. 1 Miller, NE cor. section 28-3-5w, an old well deepened, had sand at 1,891-95 feet, total depth, swabbed 40 bbls. of oil the first 24 hours and was completed as a 20-bbl. pumper.

In Jefferson County, Long, Yingling & Lauck No. 17 Seay, SE SW SE section 3-7s-5w, pumped 27 bbls. of oil in 24 hours and was completed at 1,089 feet, total depth. Sand was topped at 1,067 feet. George Pace No. 1 Gardner, SW cor. section 23-5s-5w, wildcat, was dry and abandoned at 2,532 feet, total depth, in shale. It had gas showing in sand at 980-84 feet.

One new completion was reported in Jefferson County. Long, Yingling & Lauck No. 19 Seay, C S half SW SE section 3-7s-5w, was a location.

In Comanche County, N. E. Milling No. 1 Miller, NE NE SW section 23-4-12w, wildcat, was abandoned at 995 feet, total depth, in lime. English Drilling Co. No. 1 A. F. Kindt, SW NW SW section 27-2-10w, had Granite Wash and sand with a showing of oil at 978-81 feet, but was dry and abandoned in sandy shale at 1,003 feet, total depth.

In Greer County, John Hooser No. 1 Sonomaker, C S half SW SW section 29-7-21w, in the Granite area, had spudded.

Central West Fields

(Continued from Page 271)

same township. In Independent Township, C. A. McMillen is going to abandon No. 1 on the Fuhrmeyer and Geisendorfer farm, section 24, same township.

In Wayne County, Ohio Fuel Gas Co. is drilling No. 1 Grace Johnson, section 2, Clinton Township; drilling No. 1 Grant Alleman, section 11, same township, and has a location staked on the A. A. Westfall farm, section 22, same township. In Chester Township, same county, the Ohio Fuel Gas Co. is drilling No. 1 Noa Hockenberry, section 31, Chester Township.

In Allen County, H. F. Kelley abandoned No. 1 on the F. B. Sellers farm, section 30, Perry Township, and the Ohio Oil Co. is drilling No. 8 on the George W. Talker farm, section 9, same county.

In Fairfield County, City Natural Gas Works is drilling No. 3 on the Rufus Conrad farm, section 34, Berne Township. Same company is drilling No. 2 Fred Crile, section 22, and drilling No. 1 Matilda Baurer, section 27, same township. In Rush Creek Township, the City Natural Gas Works is drilling No. 1 W. C. Mossburger, Lot 31; drilling No. 1 C. Stalder farm, section lot 31; and has rig in for No. 1 D. Stalder farm, Lot 39, same township.

In Sandusky County, Homer E. Keiser is drilling No. 17 Homer Russell farm, section 8, Jackson Township. Klingberg & Co. is drilling No. 2 Edward Bowe farm, section 17, Scott Township.

KENTUCKY FIELD

In Ohio County, Kentucky, the Kentucky Natural Gas Co. No. 13 on the Nannie Rogers farm, in the Maddox pool, produced an initial of 115 bbls. In the same pool, B. E. Calvert & Co. No. 4, on the P. R. Kelley farm, is a dry hole. Lowe & Co. No. 1, on the John Powell farm, in the Dearfield area, and Ekis & Co. No. 1 on the Richards heirs farm, were dry holes.

In McLean County, Kentucky, Hupp & Duff No. 3 on the Tanner tract, produced an initial of 150 bbls. and Walter Sargents No. 2 on the Tanner tract, for an initial of 50 bbls.

WILDCAT OPERATIONS

CALIFORNIA

IMPORTANT WELLS AND NORTHERN CALIFORNIA WILDCATS

Company, well and location—	S.T.R.	Depth	Status
Shell Oil Co., No. 11 Capitan, Santa Barbara Co.	32- 5-30	2,789	rig to pump
Shell Oil Co., No. 12 Capitan, Santa Barbara Co.	32- 5-30	2,600	rig to pump
Shell Oil Co., No. 13 Capitan, Santa Barbara Co.	32- 5-30	907	cmtd. 907
Shell Oil Co., No. 14 Capitan, Santa Barbara Co.	32- 5-30	952	sd. sh. drig.
La Canada Oil Co., No. 1 Capitan, Santa Barbara Co.	32- 5-30	....	bldg. rig.
Honolulu Oil Corp., No. 9 Elwood, Santa Barbara Co.	tideland	7,014	P.B. 6,705
Barnsdall-Rio Grande, No. 9 Elwood, Santa Barbara	tideland	3,755	C.P. 3,655
Barnsdall-Rio Grande, No. 12 Elwood, Santa Barbara	15- 4-29	8,506	fish. D.P.
York Oil Co., No. 3 Lompoc, Santa Barbara Co.	33- 8-34	....	rigging up
Union Oil Co., No. 16 Orcutt, Santa Barbara Co.	26- 9-34	3,305	br. sh. drig.
Santa Barbara Oil, No. 1 Carpinteria, Santa Barbara	29- 4-25	2,290	P.B. 1,950
Cornero, Tony, No. 1 Carpinteria, Santa Barbara Co.	8- 4-25	1,001	sd. sh. drig.
Bankline Oil Co., No. 1 Coal Oil Pt., Santa Barbara	tideland	5,510	redrig. 700
Anacapa Oil Co., No. 4 Mesa, Santa Barbara Co.	28- 4-27	1,353	sd. sh. drig.
Calco Pet. Co., No. 1 Las Posas, Ventura Co.	17- 3-20	3,210	fish. reamer
Union Oil Co., No. 10 Bardsdale, Ventura Co.	13- 3-20	6,055	swabbing
Pet. Securities Co., No. 1 Bardsdale, Ventura Co.	7- 3-19	3,862	gr. sh. drig.
Calkan Pet. Co., No. 1 Sespe, Ventura Co.	23- 5-20	510	sd. sh. drig.
Concor Oil Co., No. 1 Sespe, Ventura Co.	6- 4-19	1,176	sd. sh. drig.
Wasibi Oil Co., No. 1 Sespe, Ventura Co.	33- 5-19	....	rigged up
Bestco Pet. Co., No. 1 Shields Canyon, Ventura Co.	2- 3-19	1,871	hd. sd. drig.
Bankline Oil Co., No. 1 Shields Canyon, Ventura Co.	3- 3-19	4,464	sd. sh. drig.
Petroleum Securities, No. 1 Shields Canyon, Ventura	3- 3-19	5,180	hd. sh. drig.
The Texas Co., No. 129 Shields Canyon, Ventura Co.	4- 3-19	4,812	P.B. 4,260
The Texas Co., No. 130 Shields Canyon, Ventura Co.	4- 3-19	782	sd. sh. drig.
The Texas Co., No. 131 Shields Canyon, Ventura Co.	4- 3-19	....	bldg. rig
Hull, James, No. 1 Santa Susana, Ventura Co.	2- 2-18	1,791	recmtd. 500
Bolsa Chica Oil Co., No. 3 Temescal, Ventura Co.	4- 4-18	1,854	br. sh. drig.
Bolsa Chica Oil Co., No. 4 Temescal, Ventura Co.	4- 4-18	....	bldg. rig.
Johnson, R. P., No. 1 Temescal, Ventura Co.	21- 4-18	1,673	P.B. 1,300
General Pet. Corp., No. 2 Oxnard, Ventura Co.	26- 2-23	6,374	sd. sh. drig.
Rincon Oil Co., No. 3 Rincon, Ventura Co.	tideland	2,193	sd. sh. drig.
Continental Oil Co., No. 5 San Miguelito, Ventura Co.	24- 3-24	2,051	sd. sh. drig.
C. C. M. Oil Co., No. 1 Javon, Ventura Co.	15- 3-24	....	rigging up
Standard Oil Co., No. 1 Lost Hills, Kern Co.	2-26-20	6,335	salt water
Richfield Oil Co., No. 2 Devil's Den, Kern Co.	14-25-18	2,676	sd. sh. drig.
Calcrude Pet. Co., No. 1 McKittrick, Kern Co.	34-30-22	800	hd. sh. drig.
Bergman Oil Co., No. 1 McKittrick, Kern Co.	32-29-22	....	rigged up
Welport Oil Co., No. 14 McKittrick, Kern Co.	26-29-21	1,501	hd. sd. drig.
Standard Oil Co., No. 4 North Belridge, Kern Co.	36-27-20	6,797	br. sh. drig.
Associated Oil Co., No. 5 North Belridge, Kern Co.	34-27-20	5,873	gr. sd. drig.
Belridge Oil Co., No. 6-1 North Belridge, Kern Co.	1-28-20	3,435	flow. 1,850 b.d.
Belridge Oil Co., No. 17-35 North Belridge, Kern Co.	35-27-20	6,392	sd. sh. drig.
Union Oil Co., No. 20 North Belridge, Kern Co.	36-27-20	9,492	P.B. 9,340
Union Oil Co., No. 21 North Belridge, Kern Co.	36-27-20	5,792	br. sh. drig.
Continental Oil Co., No. 7 North Belridge, Kern Co.	36-27-20	7,770	hd. sh. drig.
C. C. M. Oil Co., No. 17 Kern Front, Kern Co.	33-28-27	2,240	cmtd. ,1912
Republic Pet. Co., No. 10 Kern Front, Kern Co.	24-28-27	1,998	sd. sh. drig.
Republic Pet. Co., No. 11 Kern Front, Kern Co.	11-28-27	....	rigging up
Republic Pet. Co., No. 12 Kern Front, Kern Co.	24-28-27	....	bldg. rig
Elbe Pet. Co., No. 1 Kern Front, Kern Co.	13-28-27	1,130	sd. sh. drig.
Vega Oil Co., No. 1 Kern Front, Kern Co.	11-28-27	1,061	sd. sh. drig.
Lloyd Oil Co., No. 1 Kern Front, Kern Co.	3-28-27	2,580	sd. sh. drig.
National Oil Co., No. 5 Kern Front, Kern Co.	1-28-27	1,758	sd. sh. drig.
Kern River Oilfields, No. 8 Kern Front, Kern Co.	26-28-27	....	bldg. rig
Associated Oil Co., No. 7 Kern Front, Kern Co.	23-28-27	....	rigging up
Standard Oil Co., No. 12 Kern Front, Kern Co.	9-28-27	2,850	rig to pump
Standard Oil Co., No. 13 Kern Front, Kern Co.	24-28-27	2,014	pump. 196 b.d.
Standard Oil Co., No. 14 Kern Front, Kern Co.	16-28-27	....	rigging up
The Texas Co., No. 16 Kern Front, Kern Co.	33-28-27	....	rigging up
Union Oil Co., No. 8 Kern Front, Kern Co.	11-28-27	1,640	sd. sh. drig.
American Expl. Co., No. 1 Kern Front, Kern Co.	16-28-27	691	sd. sh. drig.
Ausbrit Oil Co., No. 1 Premier, Kern Co.	20-27-27	2,139	P.B. 2,060
Unger, M., No. 1 Dominion, Kern Co.	27-26-28	1,423	cmtd. 1,409
Santa Carla Oil Co., No. 1 Mount Poso, Kern Co.	7-26-28	2,008	dry; abd.
McMahan, Hugh, No. 1 Mount Poso, Kern Co.	27-26-28	1,581	P.B. 1,537
Union Oil Co., No. 11 Mount Poso Tribe, Kern Co.	28-27-28	....	bldg. rig
Vanguard Oil Co., No. 4 Mount Poso, Kern Co.	33-27-28	1,788	pump. 415 b.d.
Cal-Coast-Apex Oil Co., No. 1 Mount Poso, Kern Co.	36-26-27	1,130	sd. sh. drig.
Borgol Oil Co., No. 1 Mount Poso, Kern Co.	11-27-27	....	location
General Pet. Corp., No. 13 Mount Poso Heisen, Kern	16-27-28	....	bldg. rig
Santa Anita Oil Co., No. 1 Mount Poso, Kern Co.	11-27-27	1,200	sd. sh. drig.
Tilton & Harp, No. 1 Mount Poso, Kern Co.	6-27-28	....	rigging up
Union Oil Co., No. 1 Poso Outpost, Kern Co.	34-27-28	1,918	sd. sh. drig.
Woods & Bailey, No. 1 McFarland, Kern Co.	16-26-26	3,486	sd. sh. drig.
Dixie Lee Oil Co., No. 2 Fruitvale, Kern Co.	23-29-27	1,755	suspended
Connelly, T. E., No. 1 Fruitvale, Kern Co.	21-29-27	2,790	sd. sh. drig.
Mosebach Oil Co., No. 1 Fruitvale, Kern Co.	21-29-27	2,575	sd. sh. drig.
Trico Oil & Gas Co., No. 1 Fruitvale, Kern Co.	23-29-27	....	rigging up
Magnet Oil Co., No. 1 Fruitvale, Kern Co.	21-29-27	4,069	pump. 148 b.d.
Western Gulf Oil Co., No. 23 Fruitvale, Kern Co.	27-29-27	3,445	test. W.S.O.
Western Gulf Oil Co., No. 25 Fruitvale, Kern Co.	27-29-27	3,400	sd. sh. drig.
Mohawk Oil Co., No. 10 Fruitvale, Kern Co.	23-29-27	3,780	flow. 210 b.d.
Hogan Pet. Co., No. 12 Mountain View, Kern Co.	32-30-29	6,049	cmtd.
Hogan Pet. Co., No. 13 Mountain View, Kern Co.	32-30-29	5,797	sd. sh. drig.
Hogan Pet. Co., No. 14 Mountain View, Kern Co.	32-30-29	3,481	sd. sh. drig.
Hogan Pet. Co., No. 15 Mountain View, Kern Co.	4-31-29	....	bldg. rig
Buffalo Oil Co., No. 3 Mountain View, Kern Co.	19-30-29	1,892	sd. sh. drig.
Buffalo Oil Co., No. 4 Mountain View, Kern Co.	19-30-29	....	location
Mohawk Oil Co., No. 16 Mountain View, Kern Co.	30-30-29	6,074	cmtd. 5,565
Mohawk Oil Co., No. 18 Mountain View, Kern Co.	30-30-29	5,985	rig to pump
Mohawk Oil Co., No. 19 Mountain View, Kern Co.	30-30-29	....	rigging up
Ohio Oil Co., No. 3 Mountain View, Kern Co.	33-30-29	5,860	flow. 1,870 b.d.
Allied Pet. Corp., No. 1 Mountain View, Kern Co.	19-30-29	5,165	cmtd. 4,964
Hancock Oil Co., No. 10 Mountain View, Kern Co.	14-30-28	....	grade
Jergins Trust, No. 8 Mountain View, Kern Co.	19-30-29	2,281	sd. sh. drig.
Shell Oil Co., No. 8 Mountain View, Kern Co.	32-30-29	5,818	flow 462 b.d.
Shell Oil Co., No. 9 Mountain View, Kern Co.	32-30-29	5,996	swabbing
Shell Oil Co., No. 10 Mountain View, Kern Co.	32-30-29	5,990	swabbing
Shell Oil Co., No. 11 Mountain View, Kern Co.	32-30-29	2,380	sd. sh. drig.
Vesta Pet. Co., No. 10 Mountain View, Kern Co.	19-30-29	....	rigging up
Standard Oil Co., No. 26 Mountain View, Kern Co.	13-30-28	4,791	sd. sh. drig.
Mohawk Pet. Co., No. 1 Arvin, Kern Co.	10-31-29	....	rigging up
R. & R. Dev. Co., No. 1 Arvin, Kern Co.	33-30-30	672	granite
Ohio Oil Co., No. 1 Rio Bravo, Kern Co.	1-30-24	7,396	sd. sh. drig.
Shell Oil Co., No. 1 Stevens, Kern Co.	29-30-26	7,888	reaming
Shell Oil Co., No. 4 Round Mountain, Kern Co.	7-28-29	1,955	bailing
Shell Oil Co., No. 6 Round Mountain, Kern Co.	7-28-29	1,548	bailing
Shell Oil Co., No. 6 Round Mountain, Kern Co.	7-28-29	....	rigging up
Shell Oil Co., No. 7 Round Mountain, Kern Co.	7-28-29	....	rigging up
Shell Oil Co., No. 8 Round Mountain, Kern Co.	7-28-29	....	bldg. rig
Shell Oil Co. No. 9 Round Mountain, Kern Co.	7-28-29	....	bldg. rig
Piute Holding Co., No. 1 Round Mountain, Kern Co.	17-28-29	....	location
Honolulu Oil Corp., No. 16 Round Mountain, Kern Co.	18-28-29	2,100	pump. 301 b.d.
Honolulu Oil Corp., No. 17 Round Mountain, Kern Co.	18-28-29	2,094	sd. sh. drig.
Honolulu Oil Corp., No. 18 Round Mountain, Kern Co.	20-28-29	....	bldg. rig
M. & L. Oil Co., No. 1 Edison, Kern Co.	23-30-29	2,011	pump. 50 b.d.
Jergins Trust, No. 22 Edison, Kern Co.	22-30-29	4,395	P.B. 4,050
Jergins Trust, No. 23 Edison, Kern Co.	23-30-29	3,287	will abd.
Buffalo Oil Co., No. 2 Edison, Kern Co.	24-30-29	1,174	cmtd. 755
Wood-Callahan Oil Co., No. 1 Edison, Kern Co.	23-30-29	....	bldg. rig
Higgins, W. F., No. 1 Edison, Kern Co.	17-30-29	....	rigging up
Monterey Expl. Co., No. 5 Edison, Kern Co.	14-30-29	2,306	pump. 40 b.d.
General Pet., No. 14 Edison, Kern Co.	24-30-29	1,453	pump. 52 b.d.
General Pet., No. 16 Edison, Kern Co.	10-30-29	1,855	O.S. drig.
General Pet., No. 17 Edison, Kern Co.	21-30-29	2,886	sd. sh. drig.
Pioneer Holding Co., No. 2 Edison, Kern Co.	17-30-30	....	rigging up
Gen. Pet. Corp., No. 1 Elk Hills, Kern Co.	5-30-24	6,149	P.B. 6,050
Bender, E. A., No. 1 San Emidio, Kern Co.	14-10-23	465	sd. sh. drig.
C. C. M. Oil Co., No. 28 Midway, Kern Co.	28-32-25	....	location
Gibson Oil Co., No. 3 Maricopa, Kern Co.	6-11-23	2,392	redrig. 1,690
Gibson Oil Co., No. 5 Maricopa, Kern Co.	5-11-23	....	rigging up
Gibson Oil Co., No. 6 Maricopa, Kern Co.	6-11-23	....	bldg. rig
Chief Oil Co., No. 2 Maricopa, Kern Co.	6-11-23	2,665	cmtd. 2,640
General Pet. Corp., No. 1 Maricopa, Kern Co.	6-11-23	2,827	flow. 1,955 b.d.
General Pet. Corp., No. 61 Maricopa, Kern Co.	24-31-23	....	rigged up
Shell Oil Co., No. 1 Maricopa, Kern Co.	7-11-23	1,172	sd. sh. drig.
Hoyt, Otis, No. 1 Maricopa, Kern Co.	7-11-23	....	bldg. rig
Standard Oil Co., No. 24 Midway-Sunset, Kern Co.	26-12-24	2,724	rig to pump
Standard Oil Co., No. 25 Midway-Sunset, Kern Co.	26-13-24	2,106	cleaning out
Standard Oil Co., No. 30 Midway-Sunset, Kern Co.	31-12-23	....	rigging up
Standard Oil Co., No. 65 Midway-Sunset, Kern Co.	26-12-24	2,160	cmtd. 1,738
Standard Oil Co., No. 54 Midway-Sunset, Kern Co.	33-32-24	3,138	rig to pump
Standard Oil Co., No. 4 Midway-Sunset, Kern Co.	5-11-23	1,871	sd. sh. drig.
Standard Oil Co., No. 219 Midway-Sunset, Kern Co.	33-32-24	....	bldg. rig
Quality Oil Co., No. 2 Midway-Sunset, Kern Co.	22-32-23	1,530	sd. sh. drig.
Berry Holding Co., No. 23 Midway-Sunset, Kern Co.	34-12-24	666	sd. sh. drig.
Alford Oil Co., No. 5 Maricopa, Kern Co.	4-32-23	....	rigging up
McAdams, Ed., No. 1 Midway-Sunset, Kern Co.	23-32-23	1,674	sd. sh. drig.
Obispo Oil Co., No. 12 Midway-Sunset, Kern Co.	32-12-23	2,123	sd. sh. drig.
Jerman, R. W., No. 1 Midway-Sunset, Kern Co.	31-12-23	4,128	P.B. 3,521
Ohio Oil Co., No. 6 Buena Vista Lake, Kern Co.	32-31-26	4,676	flow. gas
Ohio Oil Co., No. 7 Buena Vista Lake, Kern Co.	5-32-26	....	bldg. rig
Superior Oil Co., No. 1 Buena Vista Lake, Kern Co.	6-32-25	4,900	dry; abd.
Ohio Oil Co., No. 1 Tejon, Kern Co.	36-11-19	....	rigging up
Reserve Oil & Gas Co., No. 5 Tejon, Kern Co.	2-10-19	2,555	dry; abd.
Reserve Oil Co., No. 1 Tejon, Kern Co.	33-11-19	6,032	P.B. 4,805
Seaboard Oil Co., No. 4 Huron, Fresno Co.	10-16-13	4,174	gr. sh. drig.
Western Gulf, No. 3 Cantua, Fresno Co.	3-17-15	4,760	hd. sd. drig.

KEY TO ABBREVIATIONS USED IN DRILLING REPORTS

Abd., abandoned.
Bldg., building.
B.D., barrels daily.
B.P., back pressure.
B.R., building rig.
Br. sh., brown shale.
B.S., basic sediment.
C.P., casing pressure.
Cd. or Crd., cored.
C.D., corrected depth.
Cg., coring.
C.L., center line.
Cmtd., cemented.
C.O., cleaning out.
Comp., completed.
Compr., compressor.
C.P., casing pressure, also cement through perforations.
Csg., casing.
D.D., drilling (or drilled) deeper.
Drlg., or Drg., drilling.
Drk. or Dk., derrick.
D.S., drill stem.
D.&A., dry and abandoned.
Fsg., fishing.
Gbo., gumbo.
G.I., gas injection.
Gr., gravity.
Gr. sd., gray sand.
Grn. sh., green shale.
Hd. sd., hard sand.
H.F.W., hole full of water.
I.P., initial production.
L., lime.
L.D.D., later drilled deeper.
Lnr., liner.
Loc., location.
M.I.M., moving in material.
M.I.R., moving in rig.
M.I.R.T., moving in rotary tools.
M.O.T., milling on tools.
O.I.H., oil in hole.
O.S., oil sand.
O.T.D., old total depth.
O.W.D.D., old well drilling deeper.
O.W.P.B., old well plugging back.
P.B., plugging or plugged back.
P.B.P., pulling big pipe.
P.L., pipe line.
P.L.O., pipe line oil.
Pmpg., pumping.
P.O.P., putting on pump.
P.P., pulled pipe.
Rd. sd., red sand.
Rd. sh., red shale.
Recmt., recemented.
Rmg., reaming.
Redrig., redrilling.
Rng., running.
R.O.G., rig on ground.
R.P., rock pressure.
R.U., rigging up.
R.U.R., rigging up rotary.
R.U.R.T., rigging up rotary tools.
R.U.S.T., rigging up standard tools.
R.&T., rods and tubing.
S. or Sd., sand.
S.D., shut down.
Sd. sh., sandy shale.
Sdtr. or St., sidetracking.
S.D.P.L., shut down for pipe line.
S.D.W.O., shut down awaiting orders.
S.G., show gas.
Sh.&L., shale and lime.
S.I., shut in.
S.I.P., shut in, prorated.
S.L.M., steel line measurement.
S.O., show oil.
S.O.G.&W., show of oil, gas and water.
Spdg. or Spd., spudding.
S.R., straightreaming.
Stdg., standardizing (also standing).
S.W., salt water.
Swbg., swabbing.
T.A., temporarily abandoned.
Tbg., tubing.
T.D., total depth.
T.P., tubing pressure.
Tr., tract.
U.R., underreaming.
W.I.H., water in hole.
W.O., workover.
W.O.C. or W.O.C.S., waiting on cement to set.
W.P., working pressure.
W.S.O., water shutoff.
W.S.O.O.K., water shutoff O.K.
W.S.O.N.G., water shutoff no good.
W.S.R. or W.O.S.R., wait on standard rig.
Wtr., water.

Conlon, J. M., No. 1 Coalinga, Fresno Co.	30-19-15	1,120	sd. sh. drlg.
Standard Oil Co., No. 1 South Coalinga, Fresno Co.	36-21-14	1,351	sd. sh. drlg.
Union Oil Co., No. 1 Lillis-Welsh, Fresno Co.	24-21-16	11,127	P.B. 10,729
K. N. D. A., No. 2 Kettleman North, Fresno Co.	20-21-17	7,740	br. sh. drlg.
K. N. D. A., No. 38 Kettleman North, Fresno Co.	18-21-17	....	rigging up
K. N. D. A., No. 74 Kettleman North, Fresno Co.	30-21-17	6,581	sd. sh. drlg.
K. N. D. A., No. 81 Kettleman North, Fresno Co.	24-21-16	....	bldg. rig
K. N. D. A., No. 86 Kettleman North, Kings Co.	36-22-18	9,733	P.B. 9,065
Standard Oil Co., No. 25 Kettleman North, Fresno Co.	19-21-17	5,861	hd. sh. drlg.
Standard Oil Co., No. 43 Kettleman North, Fresno Co.	19-21-17	....	rigging up
Standard Oil Co., No. 56 Kettleman North, Fresno Co.	19-21-17	4,191	sd. sh. drlg.
Standard Oil Co., No. 65 Kettleman North, Fresno Co.	19-21-17	6,791	br. sh. drlg.
Standard Oil Co., No. 72 Kettleman North, Fresno Co.	19-21-17	6,480	br. sh. drlg.
Standard Oil Co., No. 2 Kettleman Middle, Kings Co.	29-23-19	6,800	gr. sd. drlg.
Kettleman View Oil Co., Well No. 1, Kings Co.	29-22-19	1,629	run liner
Commonwealth Consd. Gas, No. 2 Tulare Lake, Kings	21-22-20	2,495	hd. sh. drlg.
Pismo Pet. Corp., No. 1 Pismo, San Luis Obispo Co.	5-32-13	2,942	pump. 240 b.d.
United Oil Co., No. 1 Cholame, San Luis Obispo Co.	2-32-21	380	sd. sh. drlg.
Martin, J. D., No. 4 Pismo, San Luis Obispo Co.	5-32-13	2,220	sd. sh. drlg.
Martin, J. D., No. 5 Pismo, San Luis Obispo Co.	5-32-13	1,965	sd. sh. drlg.
Birch-Royer Oil Co., No. 1 Pismo, San Luis Obispo Co.	33-31-13	1,598	sd. sh. drlg.
Barnsdall Oil, No. 1 Carissa Plains, San Luis Obispo	24-28-17	3,475	sd. sh. drlg.
Holly Dev. Co., No. 1 Tracy, San Joaquin Co.	16- 2- 5	2,961	sd. sh. drlg.
Standard Oil Co., No. 1 McDonald Island, San Joaquin	25- 2- 4	4,652	sd. sh. drlg.
Pure Oil Co., No. 3 Chowchilla, Madera Co.	17-10-14	....	bldg. rig
Northern Counties Pet., No. 1 Tehama, Tehama Co.	25-24- 3	7,340	sd. sh. drlg.
Shell Oil Co., No. 1 Branch, Monterey Co.	34-24-10	8,397	sd. sh. drlg.
The Texas Co., No. 2 Eureka, Humboldt Co.	22- 3- 1	4,357	fish. D.P.
Amerada Pet. Co., No. 1 Emigh, Solano Co.	26- 4- 2	1,991	sd. sh. drlg.

IMPORTANT WELLS AND SOUTHERN CALIFORNIA WILDCATS

Company, well and location—	S.T.R.	Depth	Status
Republic Pet. Co., No. 2 El Segundo, Los Angeles Co.	18- 3-14	7,477	flow, 460 b.d.
Marvin, J. L., No. 1 El Segundo, Los Angeles Co.	7- 3-14	7,285	sd. sh. drlg.
Signal Finance, No. 1 Hawthorne, Los Angeles Co.	10- 3-14	3,841	rigging up
Shell Oil Co., No. 1 Moneta, Los Angeles Co.	33- 3-14	7,352	P.B. 4,240
White Five Oil Co., No. 1 Torrance, Los Angeles Co.	31- 3-14	3,885	P.B. 3,790
White Five Oil Co., No. 2 Torrance, Los Angeles Co.	31- 3-14	....	material
Linderman, G. K., No. 1 Torrance, Los Angeles Co.	31- 3-14	3,751	pump. 270 b.d.
Regent Oil Co., No. 1 Torrance, Los Angeles Co.	6- 4-14	1,160	sd. sh. drlg.
Sterling Oil Co., No. 1 Torrance, Los Angeles Co.	31- 3-14	3,577	cleaning out
Roach, W. C., No. 1 Torrance, Los Angeles Co.	31- 3-14	2,160	sd. sh. drlg.
Walken Oil Co., No. 1 Torrance, Los Angeles Co.	5- 4-14	2,962	sd. sh. drlg.
Dumas-Brown Oil Co., No. 1 Torrance, Los Angeles Co.	6- 4-14	....	rigging up
B. & N. Oil Co., No. 1 Torrance, Los Angeles Co.	18- 4-14	3,369	pump. 230 b.d.
Langstaff Pet. Corp., No. 1 Torrance, Los Angeles Co.	31- 3-14	....	bldg. rig
Lawler Pet. Co., No. 1 Torrance, Los Angeles Co.	31- 3-14	....	rigging up
Macvan Oil Co., No. 1 Torrance, Los Angeles Co.	31- 3-14	1,471	sd. sh. drlg.
Redondo Oil Corp., No. 1 Torrance, Los Angeles Co.	31- 3-14	952	sd. sh. drlg.
Tu-Jax Oil Co., No. 1 Torrance, Los Angeles Co.	32- 3-14	3,120	sd. sh. drlg.
Continental Royalties, No. 1 Torrance, Los Angeles Co.	32- 3-14	....	rigging up
Rennek Oil & Gas Co., No. 1 Torrance, Los Angeles Co.	5- 4-14	3,448	cleaning out
Rennek Oil & Gas Co., No. 2 Torrance, Los Angeles Co.	5- 4-14	....	rigging up
C. C. M. Oil Co., No. 23 Torrance, Los Angeles Co.	8- 4-14	4,865	br. sh. drlg.
West American Oil Co., No. 1 Dominguez, Los Angeles	3- 4-13	8,297	sd. sh. drlg.
Crude Oil Drlg. Co., No. 1 Gardena, Los Angeles Co.	31- 3-13	....	material
Union Oil Co., No. 8 Dominguez Carson, Los Angeles	13- 3-13	6,000	sd. sh. drlg.
Shell Oil Co., No. 1 Long Beach, Los Angeles Co.	13- 4-13	6,389	dry; abd.
Barnsdall Oil Co., No. 15 Rosecrans, Los Angeles Co.	18- 3-13	4,955	fishing
Mars Oil Co., No. 1 Athens, Los Angeles Co.	7- 3-13	3,968	pump. water
Associated Oil Co., No. 15 Seal Beach, Los Angeles Co.	11- 5-12	5,180	sd. sh. drlg.
Standard Oil Co., No. 27 Seal Beach, Los Angeles Co.	3- 5-12	5,598	sd. sh. drlg.
Eastern Oil Co., No. 1 Del Rey, Los Angeles Co.	22- 2-15	7,329	cmtd. 835
Deuel, W. E., No. 1 Del Rey, Los Angeles Co.	27- 2-15	....	bldg. rig
Union Oil Co., No. 21 Del Rey, Los Angeles Co.	27- 2-15	6,068	O.S. drlg.
Union Oil Co., No. 22 Del Rey, Los Angeles Co.	27- 2-15	....	rigging up
Yant Pet. Corp., No. 1 Newhall, Los Angeles Co.	1- 3-16	2,023	cleaning out
Barnsdall Oil Co., No. 1 Newhall, Los Angeles Co.	34- 4-17	....	location
Jones & Co., No. 1 Newhall, Los Angeles Co.	8- 4-16	....	bldg. rig
Harbor Pet. Co., No. 1 Wilmington, Los Angeles Co.	28- 4-13	1,161	sd. sh. drlg.
Sovereign Oil Co., No. 1 Wilmington, Los Angeles Co.	28- 4-13	3,663	P.B. 3,535
Codri Oil Co., No. 1 Wilmington, Los Angeles Co.	29- 4-13	3,568	cleaning out
General Pet. Corp., No. 1 Wilmington, Los Angeles Co.	4- 5-13	....	rigging up
Standard Oil Co., No. 79 Montebello, Los Angeles Co.	2- 2-12	6,351	sd. sh. drlg.
Standard Oil Co., No. 81 Montebello, Los Angeles Co.	2- 2-12	3,750	recmtd. 3,552
Standard Oil Co., No. 82 Montebello, Los Angeles Co.	2- 2-12	7,600	gr. sd. drlg.
Standard Oil Co., No. 83 Montebello, Los Angeles Co.	2- 2-12	3,270	pump. water
Womac, Inc., No. 2 Montebello, Los Angeles Co.	4- 2-11	3,164	pump. 130 b.d.
Woodard, J. A., No. 1 Montebello, Los Angeles Co.	4- 2-11	3,660	suspended
The Texas Co., No. 12 Montebello, Los Angeles Co.	5- 2-11	6,980	flow. 340 b.d.
Universal Consd., No. 6 Montebello, Los Angeles Co.	5- 2-11	5,571	cmtd.
Wilshire Oil Co., No. 1 Montebello, Los Angeles Co.	5- 2-11	6,352	cleaning out
Richfield Oil Co., No. 1 Montebello, Los Angeles Co.	5- 2-11	5,270	hd. sd. drlg.
Richfield Oil Co., No. 2 Montebello, Los Angeles Co.	5- 2-11	4,181	sd. sh. drlg.
North American, No. 2 Montebello, Los Angeles Co.	5- 2-11	5,652	hd. sh. drlg.
St. Helens Pet. Co., No. 7 Montebello, Los Angeles Co.	5- 2-11	3,461	hd. sh. drlg.
Oil & Gas Associates, No. 1 Pico, Los Angeles Co.	9- 2-11	4,281	repair mach.
McVicar & Rood, No. 1 San Jose Hills, Los Angeles	6- 2- 9	672	sd. sh. drlg.
Great Coastal Oil Co., No. 1 Elsinore, Riverside Co.	26- 5- 5	2,266	hd. sd. drlg.
Commander Oil Co., No. 1 Newport, Orange Co.	29- 6-10	2,130	cleaning out
Terry, George, No. 1 Westminister, Orange Co.	17- 5-11	....	rigging up
Hillman & Long, No. 1 Westminister, Orange Co.	14- 5-11	7,582	sd. sh. drlg.
Union Oil Co., No. 22 Chapman Richfield, Orange Co.	30- 3- 9	....	location
Union Oil Co., No. 29 Chapman Richfield, Orange Co.	30- 3- 9	2,978	cmtd. 2,915
Union Oil Co., No. 31 Chapman Richfield, Orange Co.	30- 3- 9	2,470	sd. sh. drlg.
Union Oil Co., No. 32 Chapman Richfield, Orange Co.	30- 3- 9	....	rigging up
Continental Oil Co., No. 1 Yorba, Orange Co.	21- 3- 9	4,796	P.B. 2,460
Tehama Pet. Co., No. 2 Kraemer, San Bernardino Co.	33- 2- 8	395	port. rig
Tehama Pet. Co., No. 3 Kraemer, San Bernardino Co.	3- 3- 8	280	port. rig
Tehama Pet. Co., No. 4 Kraemer, San Bernardino Co.	32- 2- 8	50	port. rig

KANSAS

Week Ending May 9. (Descriptions are East unless marked otherwise)

Barton County

Arch E. Merriam No. 1 Rocken. SW SW SE sec. 27-17-11w. K.C. 2,994 ft.; Cong. 3,288 ft.; Siliceous 3,371 ft.; T.D. 3,390 ft.; D.&A.

Buchanan & Alexander No. 1 Langfeld NE NE SW sec. 14-20-11w. K.C. 3,023 ft.; T.D. 3,290 ft.; swbd. 15 B.P.H.; acidized.

John Burton No. 1 Wendel, NE cor. sec. 13-19-11w. S.D. 62 ft.

Davison et al No. 1 Birzer, SW SE SW sec. 22-17-12w. Anhydrite 760 ft.; drlg. 2,340 ft.

Morgan & Flynn et al No. 1 Zimmer, SW NE SW sec. 29-19-14w. Siliceous 3,410 ft.; drlg. 3,586 ft.

Murphy & Morgan No. 1 Robinson, NE NE SW sec. 21-16-14w. Drlg. 2,460 ft.

G. H. Rose and W. H. Lant No. 1 Redetzke, NE NW NW sec. 1-16-11w. R.U.

Rose Spring Drlg. Co. et al No. 1 Rick, NW cor. sec. 1-19-11w. Rig.

Roy Ramsey et al No. 1 Hunt NW cor. sec. 19-18-11w. Siliceous 3,382 ft.; T.D. 3,404 ft.; est. 25 bbls. oil per day. P.B. 3,402 ft.; acidized; no increase; P.B. 3,400 ft.

Schermerhorn Oil Co. No. 1 Hunter, NE cor. sec. 29-18-15w. Set 8-in. csg. 3,180 ft.

Simpson & Noble and Atlantic Oil Producing Co. No. 1 Hiss. C NW NE sec. 21-20-13w. Anhydrite 753 ft.; K.C. 3,205 ft.; T.D. 3,290 ft.; swbd. 230 bbls. oil in 24 hrs.

Terry & Fessler No. 1 Feist, NE NE SE sec. 29-18-11w. Siliceous lime 3,430-31½ ft.; T.D.; potential; pumped 346 bbls. oil in 18½ hrs.

Wakefield & Johnson No. 1 Bumm, SW SW NE sec. 22-19-12w. Drlg. 625 ft.

Butler County

Dalton et al No. 1 Miley, C SW NE sec. 17-27-5. R.U.

Ellis et al No. 1-A Pettit, SE SE NW sec. 21-28-6. Drlg. 995 ft.

McGinnis et al No. 1 Hinnen, NE NE SW sec. 18-24-4. R.U. machine.

Sanford et al No. 1 Weaver Est., SE SE NE sec. 11-28-5. Drlg. 1,495 ft.

Cowley County

Baden Prod. Co. No. 1 Sparks, SE SW NW sec. 35-33-4. Drlg. 270 ft.

Benedum-Trees No. 1 Carson, SW SW NW sec. 8-30-4. R.U. machine.

Craft et al No. 1 Whitson, NE NE NE sec. 20-33-4. Drlg. 50 ft.

DeGenther Oil Co. No. 1 Holt, NW NW SE sec. 15-30-5. R.U.

W. M. McKnabb No. 1 Community, C NE NW sec. 14-34-3. Rig.

D. D. Mickleson et al No. 1 Wallace, SW SE SE sec. 10-33-4. T.D. 35 ft.; abd.

A. D. Morton et al No. 1 Roger, SE SE NE sec. 1-31-4. Spudded and S.D.

Both & Faurot No. 1 Guthrie, NW cor. Lot 14, sec. 30-33-8. H.F.W. 3,146 ft. W.O.C.

Cameron & Pulse No. 1 Simpson, C NE NW sec. 3-30-4. R.U.

Wakefield et al No. 1 Daniels, SE SW SE sec. 3-30-3. Drlg. 522 ft.

Edwards County

Stanolind O. & G. Co. et al No. 1 Donovan, C SE SE sec. 14-26-18w. Anhydrite 1,167 ft.; drlg. 3,300 ft.

Ellis County

James Brouk et al No. 1 Jacobs, NW NW SE sec. 31-15-16w. Bldg. rig.

Empire O. & R. Co. No. 1 Heri, SE cor. sec. 22-15-19w. Rigging up.

Bridgeport Machine Co. et al No. 1 Madden Est., NE NW NW sec. 26-15-18w. Anhydrite 1,110 ft.; drlg. 1,880 ft.

Brunson & Ewers-Simpson No. 1 Gross. NE NE SW sec. 29-14-17w. Anhydrite 1,110 ft.; Topeka 2,960 ft.; S.D. 3,075 ft.

Harris & Haun et al No. 1 Schmeidler, SE SE SW sec. 3-13-17w. Drlg. 1,100 ft.

Jones Bros. & Carpenter et al No. 1 Solomon, SE SE SW sec. 28-11-19w. Anhydrite 1,408 ft.; drlg. 2,630 ft.

Lario Oil & Gas et al No. 1 Walter, SE NE SW sec. 2-12-18w. Anhydrite 1,314 ft.; Topeka 3,060 ft.

Muth et al No. 1 Penney, SW SW SE sec. 29-14-18w. M.I.M.

Tom Palmer No. 1 Schoenthaler, NE NE NW sec. 31-12-19w. Drlg. 2,385 ft.; T.D. 3,165 ft.; 2,000 ft. oil in hole; U.R.

Parrish & Denman No. 1 Walter, SE SW SE sec. 14-13-17w. R.U.

Albec Oil Co. No. 1 Union Pacific, NE cor. sec. 9-13-20w. Spudded and set pipe.

Twin Drlg. Co. No. 1 Copeland, NE NE SW sec. 26-14-19w. Drlg. 1,017 ft.

Twin Drlg. Co. No. 1 Reidel, SW SW NE sec. 27-12-16w. Oswald 3,212 ft.; Siliceous 3,507 ft.; T.D. 3,536 ft.; D.&A.

Wolf Creek Oil Co. et al No. 1 Polifka, SW SW NE sec. 24-13-18w. Cellar.

Yarnell & Carlson No. 1 Phillip, NW NW SE sec. 2-14-18w. Drlg. 2,035 ft.

Ellsworth County

Empire O. & R. Co. et al No. 1 Kroesch, NW NW SE sec. 33-17-9w. Drlg. 3,221 ft.

Finney County

Helmerich & Payne No. 1 Jones, C SE sec. 24-26-34w. Rig.

Lone Star State Drlg. Co. No. 1 Hamlin, SW SW NE sec. 31-24-34w. Drlg. 2,239 ft.

Graham County

Vickers Pet. Co. & Phillips Pet. Co. No. 1 Hutton, NE NE SE sec. 29-8-22w. Anhydrite 1,505 ft.; drlg. 2,470 ft.

Greenwood County

Hale & Reese No. 1 Needles, NE SE NW sec. 12-25-10. S.D. 285 ft.

Ward McGinnis No. 1 Dater, NW NW SW sec. 11-24-8. Drlg. 1,910 ft.

Ward McGinnis No. 1 Lampe, NW NE SW sec. 26-24-8. R.U.

Harper County

Marathon Oil Co. No. 1 Zellers, C SW NW sec. 17-35-8w. Wilcox sand 5,320 ft.; S.O. and gas, salty taste; T.D. 5,410 ft.; fsg.

Harvey County

Harburney Oil Co. No. 1 Schrag, NW NW SE sec. 24-22-3w. U.R. 8-in. csg. 2,855 ft.

Haskell County

Helmerich & Payne et al No. 1 Larson, C SE sec. 28-28-32w. Rig.

Kuhn Brothers et al No. 1 Nilson, SW SW SE sec. 21-28-32w. R.U.R.

Kingman County

D. R. Lauck et al No. 1 Prather, C SE sec. 18-27-8w. Rotary rig.

D. R. Lauck et al No. 1 Skilling, C E½ E½ SW sec. 23-27-8w. O.W.D.D.; drlg. 4,552 ft.

Oklahoma Oil Corp. et al No. 1 Reeves, NW cor. sec. 29-27-5w. B.R.

McPherson County

Empire Oil & Ref. Co. No. 1 Cunningham, SE cor. sec. 26-18-1w. Set 10-in. csg. 2,-120 ft.

T. C. Johnson, et al No. 1 A. R. Johnson, SW SW NW sec. 33-17-1w. R.U.

Ness County

Continental Oil Co. No. 1 Thompson, C E½ E½ SW sec. 13-18-26w. Siliceous and S.O. 4,446-50 ft.; set 7-in. csg. 4,445 ft.

Reno County

Cheney et al No. 1 Moore, NE cor. sec. 14-26-8w. Drlg. 3,350 ft.

Dickey Oil Co. No. 1-A Shepherd, NE NE NW sec. 32-26-9w. Chat 2,870 ft.; wtr., 4,161 ft.; P.B. 4,156 ft.

Foraker et al No. 1 Hiett, SE SW NE sec. 34-24-4w. S.O. 2,874 ft.; C.O. 2,880 ft.

Helmerich & Payne et al No. 1 Schwaiger, SW SE NE sec. 27-26-7w. Viola 4,006 ft.; Simpson 4,032 ft.; Siliceous 4,103 ft.; T.D. 4,147 ft.; D.&A.

Miller et al No. 1 Detter, NE SE NW sec. 28-22-7w. Spudded and S.D.

Rose Spring Drlg. Co. No. 1 Swansen, NE NE NW sec. 1-23-5w. M.I.M.

Rice County

Beardmore et al No. 1 Fuller, SW SW SE sec. 23-18-7w. Drlg. 1,910 ft.

Day No. 1 Mason, NW NE NE Sec. 28-21-7w. Chat 3,388-3,400 ft.; acidized; pumped 133 bbls. in 5 hrs.

Dickey Oil Co. and Continental Oil Co. No. 1 Newkirk, NE NE SW sec. 11-18-7w. Simpson 3,179 ft.; drlg. 3,225 ft.

Duwe & Schneider No. 1 Wright, NE cor. sec. 36-21-7w. K.C. 2,925 ft. H.F.W. 3,055 ft.; fsg. 3,085 ft.

Glimac Oil Co. No. 1 Sargent, SE cor. sec. 31-18-6w. S.D. 865 ft.

Grattan et al No. 1 Williams, SW SW NW sec. 17-18-7w. K.C. L. 2,818 ft.; cg. 3,202 ft.; H.F.W. 3,207-12 ft.; S.D.

Gulf Oil Corp. No. 1 Steckel, SW cor. sec. 30-19-10w. Set 10-in. csg. 150 ft.

Permian Oil Co. No. 1 Monroe, C NE NE sec. 9-20-7w. Set 10-in. csg. 2,114 ft.; S.D. 2,605 ft.

Sage et al No. 1 Patton, SW cor. sec. 5-21-7w. Rig.

Shell Pet. Corp. et al No. 1 Hafermann, C N½ N½ SE sec. 6-19-9w. Bldg. rig.

Shell Pet. Corp. No. 1 Maughlin, NE NW SE sec. 11-20-8w. Drlg. 1,100 ft.

Simpson & Noble et al No. 1 Pulliam, C S½ N½ NE sec. 35-19-8w. Drlg. 1,850 ft.

Simpson & Noble and Stanolind O. & G. Co. No. 1 Bowman, SW SW NW sec. 22-19-10w. Loc.

Skiles et al No. 1 Stout, SE cor. sec. 6-21-9w. Drlg. 1,615 ft.

W. E. Witt No. 1 Hill, SE SE NW sec. 3-20-9w. K.C. 2,854 ft.; Siliceous 3,222 ft.; T.D. 3,252 ft.; D.&A.

Rooks County

Hartman & Blair et al No. 1 Hall, NW cor. sec. 25-10-17w. Rigging up.

L. C. D. Drlg. Co., et al No. 1 Westhusin, C NE SE sec. 11-9-17w. Bldg. rig.

J. H. Lester No. 1 Methene, SE SE NE sec. 29-10-20w. Drlg. 1,000 ft.

Murfin et al No. 1 Wasthusin, NE NE SE sec. 19-9-16w. Drlg. 2,725 ft.

J. A. Shoemake No. 1 Stebbins, NE NE SW sec. 26-7-17w. Loc.

Skaer Oil Corp. et al No. 1 Dryden, NE cor. sec. 28-10-17w. Drlg. 1,220 ft.

Trees Oil Co. No. 1 Minx, SW cor. sec. 31-10-18w. Location.

Rush County

Boyle & Grossman No. 1 Wilson, NE cor. sec. 33-17-19w. Drlg. 1,190 ft.

Ira Keith et al No. 1 Dartmouth Savings Bank, SW SW NE sec. 3-17-18w. Oswald 3,235 ft.; R.U.S.T. 3,346 ft.

National Refining Co. No. 1 Werth, NW NE NE sec. 7-16-18w. Anahydrite 1,195 ft.; drlg. 3,100 ft.

Pryor & Lockhart et al No. 1 Stegman, SW NW NE sec. 11-16-17w. Set 15-in. csg. 542 ft.

Rose Spring Drlg. Co. et al No. 1 Jacobs, SW SE NW sec. 8-16-17w. Drlg. 3,430 ft.

Russell County

R. G. Berry et al No. 1 Cook, NE NE SE sec. 19-11-13w. Oswald 3,097 ft.; set 8-in. csg. 3,107 ft.

Bridgeport Machine Co. et al No. 1 Wyckoff, SE NW NE sec. 27-11-13w. Oswald 2,955 ft.; T.D. 3,460 ft.; D.&A.

Central Pet. Co. No. 1 Furthmeyer, NE cor. sec. 28-14-15w. Anhydrite 828 ft.; drlg. 2,800 ft.

Darby Petroleum Corp. and Continental Oil Co. No. 1 Letsch, SE NE NW sec. 34-14-13w. Granite wash 3,238 ft.; granite 3,262-65 ft.; T.D.

Eisenhour & Shaffer No. 1 Humes, SW SW SW sec. 6-14-12w. Drlg. 2,900 ft.

Hartman & Blair No. 1 Johnston, NW cor. sec. 11-13-14w. Rig.

Hartman & Blair No. 1 McAllister, SW SW SE sec. 24-13-15w. Drlg. 470 ft.

Lario Oil & Gas Co. et al No. 1 Steinert, NE NE SW sec. 21-15-15w. Cellar.

Stearns & Streeter et al No. 1 John Hancock Ins. Co., SE SW SW sec. 31-12-14w. Topeka 2,567 ft.; S.O. 2,815-20 ft.

R. C. Tarrant No. 1 Williamson, SE SE NW sec. 9-14-14w.
Tarkio lime 2,515 ft.; T.D. 3,550 ft.; swbd. 5 bbls. oil per hr., and showing of wtr.; acidized with 1,000 gals.; made potential of 243 bbls. of oil.

P. G. Reynolds No. 1 Fredrickson, SE SW SE sec. 6-13-12w. Oswald 2,987 ft.; drlg. 3,130 ft.

Wakefield et al No. 1 Krug, NE NW SW sec. 7-15-14w. Spudded.

Saline County

James Brouk et al No. 1 Otheiander, NE NW SE sec. 10-16-3w. Bldg. rig.

Sedgwick County

Joe Aylward et al No. 1 Harrison, SE SE SW sec. 23-25-2. Rig.

Dickey Oil Co. No. 1 Ayers, SW SW NW sec. 12-27-2. Fsg. 2,617 ft.

D. R. Lauck No. 1 Parke, SE SE NE sec. 17-25-2. Drlg. 685 ft.

Stafford County

Stanolind O. & G. Co. and Atlantic Oil Prod. Co. No. 1 Shotton, SW cor. sec. 27-22-13w. Anhydrite 735 ft.; K.C. 3,420 ft.; S.O. 3,549-63 ft.; to make D.S.T.

Sumner County

Craft & Wilson No. 1 Nevitt, NE NW NE sec. 36-32-2e. Stalnaker 2,223 ft.; K.C. L. 2,608 ft.; drlg. 2,630 ft.

Helmerich & Payne et al No. 1 Elwell, NW NW NE sec. 18-34-1. Chat 3,867 ft.; S.D. 4,000 ft.

D. L. Husted et al No. 1 Evers, SE SE NE sec. 27-31-3. Set 12-in. csg. 412 ft.

Matthews & Derrington No. 1 Berry, NW NW SE sec. 14-35-1. S.G. 2,187 ft.; S.D. 2,306 ft.

Pryor & Lockhart et al No. 1 Knowles, SW cor. sec. 30-30-1. K.C. L. 2,858 ft.; Chat 3,489-96 ft.; R.U.S.T.

E. B. Shawver No. 1 Judd, SW SE NE sec. 3-34-2. Rig.

Texas Co. No. 1 Reed, NE SE SE sec. 11-31-1w. R.U.R.

Wilcox O. & G. Co. et al No. 1 Hess, SE SE NW sec. 13-34-2w. Chat 4,120 ft.; drlg. 4,174 ft.

D. J. Wilson et al's No. 1 Clark, 1,320 ft from W and 25 ft. from S line of NW sec. 15-35-1w. Fsg. 4,170 ft.

Trego County

Central Commercial's No. 1 Wagg, NW NW SE sec. 17-13-21w. K.C. lime 3,649 ft.; bailed 10 bbls. oil in 8 hrs. at 3,950 ft.; drlg. 3,972 ft.

J. J. Hall et al No. 1 Deines, SE SE SE sec. 12-13-24w. R.U.

R. B. McNeely et al No. 1 Lemke, NW NW SW sec. 7-11-22w. Rotary rig.

Woodson County

N. C. Dunn No. 1 Dawson, C NW NE sec. 27-26-13. L. 1,505 ft.; T.D. 1,527 ft.; P.B. 1,200 ft.; H.F.O.; no test.

Foster et al No. 1 Timm, SE NW NE sec. 36-25-13. S.O. 602-07 ft.; H.F.W. 612 ft.; T.D.; P.B. 607 ft.

Roy Johnson No. 1 Hare, C N½ NW NE sec. 32-25-14. Drlg. 1,247 ft.

Mendenhall et al No. 1 Hunter, NE cor. sec. 36-25-14. Drlg. 1,110 ft.

C. L. Sheedy No. 1 Baker, SE SE NW sec. 2-26-14. T.D. 1,560 ft. P.B. 1,416 ft.

C. L. Sheedy et al No. 1 Fuhlhage, NE NW SW sec. 27-25-14. Loc.

OKLAHOMA

Week Ending May 9

NORTHERN OKLAHOMA

Beckham County

Jo-Gail Drlg. Co. No. 1 Gilliland, C NE NE sec. 33-8-26w. Loc.

Wood Pet. & Royalty Corp. No. 1 Blair, C NW SE sec. 32-9-26w. Granite wash 2,-942-71 ft.; granite 2,984 ft.; T.D. 2,989 ft.; S.D.

Caddo County

Denver Prod. & Ref. Co. No. 1 Sah-Can C SE SE sec. 33-10-10w. T.D. 8,147 ft.; bailed down 3,400 ft.; got S.W.; D.&A.

Cleveland County

Hall-Briscoe, Inc. No. 1 Fant, S.W SW NE sec. 27-10-2w. S.D. at 7,511 ft.

Asa Lee Mayes, Inc., No. 1 Parsons, SW SW SE sec. 30-9-1. T.D. 3,510 ft.; tools moved out, may make new contract.

Coal County

Shell Pet. Corp. No. 2 Hill, SE SE NW sec. 30-3-10. Hunton 5,280 ft.; Sylvan 5,355 ft.; Viola 5,448 ft.; S.O. 5,640-57 ft.; Bromide 5,560 ft.; McLish 5,720 ft.; cd. 5,946-6,046 ft. in Dolomite; cg. 6,-167 ft.

Comanche County

N. E. Milling No. 1 Miller, NE NE SW sec. 23-4-12w. T.D. 995 ft.; abd.

Garfield County

Herndon Drlg. Co. et al No. 1 Branson, SW SW SE sec. 22-24-3w. Drlg. 4,780 ft.

W. J. Sherry et al No. 1 Haken, NW NW SW sec. 32-20-10w. Miss. lime 5,960 ft.; whipstock 5,839 ft.; drlg. by 6,100 ft.

Stanolind O. & G. Co. et al No. 1 Brunken, SW SW NE sec. 32-23-4w. Top Dense 5,915 ft.; Dolomite 5,935 ft.; T.D. 5,962 ft.; 2,100 ft. salt water in hole; slight show gas; cmtd. off wtr.; W.O.C.

Garvin County

Charles E. Carter et al No. 1 Wood, NW SW SE sec. 5-4-3. O.W.D.D.; drlg. 1,-994 ft.

McElreath & Suggett No. 1 Lasater, SE SE SW sec. 2-2-1w. M.I.T.

Hughes County

Blackwell Oil & Gas Co., No. 1 Long, SE NE NW sec. 29-9-9. Drlg. 1,015 ft.

M. H. Halsey No. 1-A Eustep, NW NW SW sec. 11-8-9.
Wapanucka 3,428 ft.; Cromwell 3,452 ft.; T.D. 3,464 ft.; 2 bailers wtr. an hr.; P.B. and shot, 3,030-45 ft.; est. 10,000,000 ft. of gas; P.B. to 3,412 ft.; re-shot.

George Orr et al No. 1 Morgan, NE SE SW sec. 6-7-9. Cellar and pits.

Phillips Pet. Co. No. 1 Eberle, NE NE SW sec. 12-5-9. Wapanucka 3,887 ft.; Cromwell 4,368 ft.; drlg. 4,848 ft.

Sinclair Prairie Oil Co. et al No 1 Wilkiy, SW cor. sec. 22-9-8. R.U.R.

Sivalls et al No. 1 Montgomery, NW SW NW sec. 7-9-9. Booch 2,950 ft.; Glicrease 3,100 ft.; S.D. for wtr., 3,165 ft.

Kay County

W. O. Allen No. 1 Fulton, SE cor. sec. 18-27-4. Drlg. 540 ft.

Kiowa County

W. C. Adams et al No. 2-A Stone, C SE SE NE sec. 34-7-17w.
T.D. 1,193 ft.; machine moved out.

Le Flore County

McCraw et al No. 1 Tidwell, C NW SE sec. 17-3-22. T.D. 1,555 ft.; S.D.

Lincoln County

Amerada Petroleum Corp. et al No. 1 Zimmerman, SW SW NE sec. 10-12-5. Rig.

McClain County

Arab Pet. Corp. No. 1 Autry, NW cor. sec. 16-7-3w. Drlg. 8,500 ft. in sh.

McCurtain County

Louis Sikes No. 1 Mitchell, C NW SW sec. 12-9s-26. Spudded and S.D. for 30 days.

McIntosh County

Indian Ty. Ill. Oil Co.'s No. 1 Tancred, 1,050 ft. S and 330 ft. E of C. Sec. 9-9-14 Wilcox 4,525 ft.; T.D. 4,536 ft.; 300 ft. wtr. in hole; P.B. to 3,285 ft.; pulling 8-in. csg.

Oklahoma Oil Corp. No. 1-A Wolf, SE SW SE sec. 25-12-17. Gas sand 800 ft.; dry sands 1,200 ft. and 1,400 ft.; set 8-in. csg. at 2,867 ft.; H.F.W. 3,555-70 ft.

Noble County

Continental Oil Co. No. 1 Pruitt, NW SE SW sec. 19-20-1w Oswego 4,388 ft.; Viola 4,972 ft.; T.D. 5,142 ft.; P.B. 5,-115 ft.; testing.

Okfuskee County

Amerada Pet. Corp. and Stanolind O. & G. Co. No. 1 Wells, SW SW NW sec. 7-11-7. Oswego 2,690 ft.; Calvin 2,714 ft.; drlg. 2,890 ft.

Champlin Ref. Co. No. 1 Thompson, SW SW NW sec. 7-13-8. Fsg. 1,147 ft.

Manahan & Grisso No. 1 Dalton, SE SE SE sec. 26-10-8.
Senora sand 1,723 ft.; T.D. 1,763 ft.; flowed 75 bbls. oil first hour after shot; in 9 hrs.; lost 4 hrs. while cleaning out.

Oklahoma County

Don Oil Co. No. 1 Berlowitz, SE SW NE sec. 9-12-3w. Digging cellar.

H. R. Hollenback et al No. 1 Cooper, NW NW NE sec. 15-11-1. Oswego, 5,435 ft. Hunton 5,857 ft.; Sylvan 5,998 ft.; drlg. 6,023 ft.

Osage County

Champlin Ref. Co. No. 1 Osage, SW SW NE sec. 35-25-6. Drlg. 1,904 ft.

Elfred Beck No. 1 Osage, SE SE NE sec. 16-23-7. Drlg. 2,075 ft.

Gray & Folson No. 1 Osage, SW SW NE sec. 33-25-7. S.D. 50 ft.

Midco Oil Corp. et al No. 1 Osage, NW NW SE sec. 11-23-6. Drlg. 1,565 ft.

Stoner Bros. No. 1 Osage, NW NE SW sec. 18-23-8. Loc.

Payne County

Amerada Pet. Corp. and Stanolind O. & G. Co. No. 1 Pratt, SE cor. sec. 29-19-5. Cellar.

Denver Producing & Ref. Co. et al No. 1 Pratt, NW cor. sec. 20-18-3. R.U.

Pontotoc County

Sandback et al No. 1 Sands, NE NE NE sec. 20-3-5. T.D. 475 ft.; R.U. machine.

Pottawatomie County

Ross Oil Co. et al No. 1 Sparkman, SE NE sec. 33-8n-4e.
C.O. 3,915 ft.; shot at 3,871-90 ft.; swbd. 250 bbls. in 24 hrs.; acidized.

J. L. Shaw No. 1 Illinois Life, NW SE NW sec. 1-4-5. Drlg. 1,590 ft.

Seminole County

Ark Royalty Co. No. 1 Kiker, SE SE NE sec. 9-10-7. Spudded and S.D.

Imperial Drlg. Co. No. 1 Aldridge, SW NE NW sec. 32-9-8. Calvin, 1,869 ft.; T.D. 1,907 ft.; P.B. 1,000 ft.; est. 6,-000,000 ft. gas; comp.

Sinclair Prairie Oil Co. et al No. 1 Harrison, NE NE NW sec. 17-8-8. Cromwell 3,232-3,360 ft.; Hunton 3,928 ft.; first Wilcox 4,245 ft.; second Wilcox 4,270 ft.; T.D. 4,290 ft.; D.&A.

Feimlee & Nichaelson No. 1 Belford, SE NW NE sec. 15-9-8. Sd. 1,460-1,505 ft.; S.O.&G.; S.D. 1,680 ft.

Washita County

L. P. McWhirter's No. 1 fee, SW cor. Sec. 34-8n-19w. T.D. 1,465 ft.; S.D.

SOUTHERN OKLAHOMA

Atoka County

Riverland Oil Co. No. 1 Jones, SW SW NE sec. 4-3s-9e. Drlg. 1,405 ft.

Bryan County

Trio Oil Co. No. 3 Gilbert, C SW sec. 25-8s-7e. T.D. 1,200 ft.; D.&A.

Carter County

Carter Oil Co. No. 1 Carter-Williams, SW NE SW sec. 27-2s-3w. T.D. 3,105 ft.; flowed 3,309 bbls. first 24 hrs.; shut in.

Carter Oil Co. et al No. 1 Leon Voorhees, C SE SW sec. 34-5s-2w. T.D. 4,900 ft.; changing tools.

W. E. Hammond No. 1 J. Rile, SW SE SE sec. 8-5s-1e. Drlg. 130 ft.

Texas Co. No. 1 Cathey, SE NE NE sec. 6-5s-1w. T.D. 4,191 ft.; pumping 20 bbls. daily, may deepen.

Cotton County

English Drlg. Co. No. 1 Wilson, NW NW SE sec. 7-4s-11w. Drlg. 1,514 ft. in sd.

Harmon County

Lloalko Trust, Ltd. No. 1 Crosnoe, SE SE SW sec. 14-3n-25w. T.D. 2,263 ft.; S.D.

Jackson County

C. P. Burnham No. 1 Oliver, NW NW SE sec. 26-1-20w. Granite Wash 1,350 ft.; gas 500,000 ft.; T.D. 1,685 ft.; S.D.

John Dickson et al No. 1 W. B. Wright, NE NW SE sec. 19-1-19w. M.I.M.

A. H. Jackman No. 1 fee, SW SW SW sec. 27-1s-24w. Drlg. 2,583 ft.

Pioneer Oil Co. No. 1 N. Rawls, SW NW NE sec. 26-1-20w. T.D. 26 ft.; S.D.

Universal Oil Co. No. 1 R. W. Brim, NW SW NE sec. 36-1s-20w. Drlg. 2,960 ft.

Jefferson County

A. T. Campbell No. 1 Trout, SE NE NE sec. 6-3s-7w. Sd. 1,525-57 ft.; T.D. 2,-560 ft.; S.D.

Geo. Pace No. 1 Gardner, SW cor. Sec. 23-5s-5w. T.D. 2,532 ft.; D.&A.

Johnston County

Equitable O. & G. Co. No. 1 Bellsey, NE SW sec. 12-2s-4e.
Arbuckle lime 1,552 ft.; drlg. 1,938 ft. in lime.

Magnolia Pet. Co. No. 1 Green, NE cor. flowed 225 bbls. in 7 hrs., and 203 bbls. sec. 12-2s-7. Hunton 1,138 ft.; Sylvan 1,395 ft.; Viola 1,547 ft.; Bromide 1,932 ft.; drlg. 2,100 ft.

Moore & Wirick No. 1 Westheimer & Daube, SE NW NE sec. 19-3s-4e. Drlg. 3,830 ft. in sh.

Love County

Amerada Pet. Corp.'s No. 1-A Westheimer & Daube, SW SE SW sec. 27-6s-3e. T.D. 7,363 ft. in L.; P.B. 6,330 ft.; acidized; made one flow of 40 bbls.

J. B. Russell et al No. 1 Scott, SW SE SW sec. 29-8s-3e. T.D. 4,968 ft.; S.D. for orders.

Sinclair Prairie Oil Co.'s No. 1 Stockton, SE SE SW sec. 26-6s-2w. T.D. 6,914 ft.; sd. 6,890-6,909 ft.; flowed and swbd. 534 bbls. oil in 5 days; drlg. 8,123 ft. in new hole; Simpson 7,962 ft.

Marshall County

Helmerich & Payne No. 1 Taliaferro, NW SE SW sec. 26-5s-5e. Rig.

Pushmataha County

C. W. Whitehead et al No. 1 Misser, SE SW SW sec. 35-3s-18e. T.A.; T.D. 3,500 ft.

Stephens County

W. G. Endicott et al No. 1 McFatridge, NW NW SW sec. 11-3s-9w. Drlg. 1,334 ft.

T. H. McCasland No. 1 J. C. Parker, NE NE SW sec. 2-1n-6w. T.D. 43 ft.; W. O.C.

Tillman County

Gulf Oil Corp. et al No. 1 McNair, NW SW SW sec. 15-3s-17w. Cellar and pits.

Gulf Oil Corp. No. 1 Wearmouth, SE NW SE sec. 21-1s-18w. T.D. 4,530 ft.; to deepen.

Johnson, Young & Mitchell No. 1 Donahoe, SW NW NW sec. 7-4s-17w. T.D. 52 ft.; S.D. for csg.

D. S. Smith No. 1-A Hammill, NE NE NW NW sec. 6-5s-15w. T.D. 1,125 ft.; S.D.

ARKANSAS

Arkansas County

Ark. O. & G. Co. No. 2 Fischer, 250 ft. S, 200 ft. E, NW cor. NE NW sec. 6-4w. Rig; S.D. W.O.

Bradley County

Phillips Pet. Co. No. 1 C. H. Murphy et al, NW cor. NW NW sec. 12-17-11. Loc.

Calhoun County

Ben G. Barnett No. 1 Freeman Smith, SE cor. sec. 36-15-14. Set 10-in. 1,600 ft.; drlg. 1,928 ft.

Clark County

Soris Tripanoff, tr., No. 1 W. Gibbons, sec. 27-8-18. Arranging to test 557 ft.

Columbia County

J. C. Buckbee, Tr., No. 1 Wilson, 330 ft. N and E, C sec. 17-17-18. Drlg. 538 ft.

Dallas County

Kel-Mac Lease & Royalty Co. No. 2 R. Owens, NW cor. NW SW sec. 26-10-16. S.D. 1,580 ft.

Hempstead County

Dixie Drlg. Co. No. 1 Wheatley, 330 ft. S, 30 ft. E, NW cor. SW NE sec. 14-11-26. R.U. and W.O.O.

Fitzwater et al No. 2 Lafferty, C NW sec. 17-14-24. Tested S.W. and W.O. 2,180 ft.

Murdock-May & Easton No. 1 Conway est., 330 ft. N and E, SW cor. NW SW sec. 17-14-24. Set 12¾-in. 80 ft.; S.D. 130 ft.

LaFayette County

Earl F. Fox No. 2 Coleman Bros., NE NE sec. 30-16-24. S.D. 3,760 ft.

Erwin & Leach No. 3 Bodcaw Lbr. Co., 330 ft. S and E, NW cor. sec. 20-16-13. Drlg. 7,199 ft.

Joe Modisett No. 1 Red River Lbr. Co., C SW SW sec. 21-19-14. Cg. 5,650 ft.

Transportation Pet. Co. No. 1 Cockran, 330 ft. S and W NE cor SE sec. 26-19-25. Tested S.W.; abd. 3,675 ft.

Miller County

Odell Hinson No. 1 Montana Realty Co., NE cor. NW NW sec. 3-17-28. Set 12¾-in. csg. 238 ft.; S.D.O.

J. W. Jones et al No. 1 J. H. Bush, sec. 2-19-27. Loc.

King Oil Corp. No. 1 G. W. Crank, SW NE sec. 19-16-25. S.D.; W.O. 2,906 ft.

King Oil Corp. No. 1 Mann, NW cor. NW SE sec. 2-16-26. Loc.

C. V. Lenz No. 8 Dale, sec. 24-15-26. Cg. 5,826 ft.

M. L. Luckett No. 1 Beck, sec. 34-15-26. Drlg. 2,400 ft.

L. H. Mahon et al No. 1 Miller Land & Timber Co., SW cor. SE sec. 29-18-27. S.D. 1,845 ft.

McAlester Fuel Co. No. 1 J. N. Cook, sec. 18-20-27. Loc.

Ouachita County

Carnes & Harrell No. 1 Dunn & Robinson, new loc., 440 ft. S, 440 ft. E, NW cor. NW SE sec. 7-12-19. Set 12½-in. csg. 180 ft.

Delta Drlg. Co. No. 1 Colin Lbr. Co., new loc. SE¼ SE¼ sec. 22-15-15. Loc.

Lion Oil Ref. Co. No. 1 Reynolds, C E½ SE NE sec. 28-15-15. Loc.

L. L. McDonald No. 1 Langley, 330 ft. N and E, SW cor. NE SW sec. 19-15-15. Cg. 2,040 ft.

Phillips Pet. Co. No. 1 Murphy, C E½ NE NE sec. 28-15-15. Loc.

Phillips Pet. Co. No. 1 J. D. Reynolds, 330 ft. N and W, SE cor. SE NW sec. 27-15-15. Comp.; 208 bbls. distillate dly. and 13,920,000 ft. gas; T.D. 4,926 ft.

J. D. Reynolds No. 1 McKenzie, 204 ft. S, 300 ft. W, NE cor. SE SW sec. 35-15-16. Fsg. for cable tools 1,970 ft.

O. F. Whittaker, Tr., No. 1 S. Howard, 600 ft. E and 150 ft. N, SW cor. NW NE sec. 20-12-16. Drlg. 868 ft.

Union County

Arkansas Southern Oil Co. No. 1 F. R. Laney, sec. 30-19-16. S.D. 175 ft.

Ark.-Southern Oil Co. No. 1 M. H. Simmons, NW cor. NW NE sec. 15-18-13. Drk.

Beuharal Oil Corp. No. 1 R. Pumphrey, SE cor. NE sec. 11-17-14. Abd. 3,267 ft.

J. C. Bucbee No. 1 Exzell, SW cor. NE NW sec. 13-17-15. Drlg. 3,300 ft.

J. E. Crosbie, Inc., No. 5 M. M. Sullivant, 393 ft. N and 341 ft. W, SE cor. SE NW sec. 12-17-14. R.U.

Kinnebrow & Simpson No. 1 L. Adams, SW cor. NE NE sec. 12-17-14. R.U.

Marine Oil Co. No. 1 Simmons, 250 ft. S and W, NE cor. SE NW sec. 10-18-13. Drk.

Marine Oil Co. No. 9-A Thompson, NW cor. SW NE sec. 10-18-13. D.&A.; T.D. 3,608 ft.

McCrossien Oil Co. No. 2 D. Norman, NE cor. NE SE sec. 3-18-13. W.O. jack to pump, 3,556 ft.

LOUISIANA

NORTH LOUISIANA PROVEN

Caddo—Rodessa

Ark.-La. Gas Co. No. 12 Rodessa Oil & Land Co., NW SE sec. 22-23-16. Cmtd. 7-in. 5,982 ft.; W.O.C. 6,010 ft.; T.D.

Ark.-La. Gas Co. No. 13 Rodessa O. & L. Co., 2,330 ft. N and 1,136 ft. W, SE cor. sec. 22-23-16. Loc.

Ark.-La. Gas Co. No. 14 Rodessa O. & Land Co., SW cor. NW sec. 23-23-16. Cmtd. 7-in. 5,995 ft.; W.O.C. 6,014 ft.; T.D.

Ark.-La. Gas Co. No. 15 Rodessa Oil & Land Co., NE cor. SW NW sec. 23-23-16. Drlg. 5,307 ft.

Ark.-La. Gas Co. No. 16 Rodessa Oil & Land Co., SE cor. NE sec. 22-23-16. Set 10-in. 3,316 ft.; drlg. 4,427 ft.

Ark.-La. Gas Co. No. 17 Rodessa O. & L. Co., SE cor. SW NW sec. 23-23-16. R.U.

Ark.-La. Gas Co. No. 18 Rodessa O. & L. Co., NW cor. sec. 23-23-16. Loc.

Ark-La Gas Co. No. 9-A Rodessa Oil & Land Co., SE NE sec. 22-23-16. Comp.; 160 B.O.P.H.; 1¼-in. tbg. choke; T.D. 6,018 ft.

Blackwell O. & G. Co. No. 1 Nugent, SW cor. NE NE sec. 8-23-15. Drlg. sh. 5,-820 ft.

S. P. Borden No. 1 K.C.S., NW cor. SW

sec. 22-23-16. Cmtd. 5 3/16-in. 6,006 ft.; W.O.C.; 6,008 ft., T.D.

Canadian Oil Co. No. 1 Comegys, SE cor. sec. 10-23-16. Drlg. 200 ft.

Danciger O. & R. Co. No. 1 Francis heirs, C Lot 2, Blk. 10, sec. 23-23-16. Cmtd. 7-in. csg.; T.D. 6,012 ft.

Danciger O. & R. Co. No. 1 J. F. Neugent, C Lot 3, Blk. 12, sec. 23-23-16. Perf. csg. 5,985-95 ft.; testing.

Duncan & Woods No. 1 Andrews, Lot 5, Blk. 21, sec. 23-23-16. Drlg. 5,950 ft.

J. Edward Jones No. 1 Ashley, Lot 6, Blk. 13, sec. 22-23-16. Perf. csg. 5,995-6,005 ft.; tstg. T.D. 6,008 ft.

J. Edward Jones No. 1 Gibson, SW cor. SE SW sec. 22-23-16. Set 16-in. 250 ft.; drlg. 4,957 ft.

W. F. Lacy No. 1 Tyson, 789 ft. W and 333 ft. S, NE cor. SE NW sec. 24-23-16. Cmtd. 7-in. 5,875 ft.; T.D. 5,997 ft.; W.O.C.

M. H. Marr et al No. 5 Hunter, 990 ft. S and 1,316 ft. E, NW cor. SW sec. 13-23-16. Cmtd. 7-in. 6,062 ft.; T.D. 6,078 ft.; W.O.C.

M. H. Marr et al No. 2 Peak, SW cor. SE sec. 11-23-16. Drlg. 3,461 ft.

R. W. Norton No. 2 Atkins Unit, NE cor. sec. 15-23-15. Set 13⅜-in. 200 ft.; cmtd. csg. 6,006 ft.; W.O.C.

R. W. Norton No. 2 Fosque Unit, SW cor. sec. 20-23-16. Drlg. 5,500 ft.

R. W. Norton No. 3 Foscue Unit, NE cor. sec. 29-23-16. Drlg.

R. W. Norton No. 4 Foscue Unit, SE cor. sec. 20-23-16. Drlg. 246 ft.

R. W. Norton No. 4-A Caddo Levee Board, NW NE sec. 21-23-16. Cmtd. 7-in. 5,971 ft.; W.O.C.

R. W. Norton No. 5-A Caddo Lv. Bd., 2,400 ft. N and 400 ft. W, C sec. 28-23-16. Loc.

R. W. Norton No. 4 Tyson heirs, 2,943 ft. N and 3,213 ft. E, SW cor. sec. 13-23-15. Drlg. 2,965 ft.

O'Brien Bros. No. 3 Rodessa Oil & Land Co., SW cor. NW SW sec. 14-23-16. Set 16-in. 230 ft.; drlg. 5,351 ft.

Phillips Pet. Co. No. 1 Adams, NW cor. sec. 17-23-15. Set 16-in. 252 ft.; drlg. 5,281 ft.

Phillips Pet. Co. No. 2 Adams, NW cor. NW NW sec. 17-23-15. Drlg. 3,335 ft.

Phillips Pet. Co. No. 4 Norton Est., SW cor. SW NW sec. 17-23-15. Cmtd. 7-in. 6,047 ft.; T.D. 6,068 ft.; W.O.C.

Phillips Pet. Co. No. 5 Norton Est., SW cor. NW sec. 17-23-15. R.U.

Phillips Pet. Co. No. 1 Robinson, C E½ NE SE sec. 18-23-15. P.B. from 6,028 ft. to 2,250 ft.

Phillips Pet. Co. No. 2 Robinson, C W½ NW SW sec. 17-23-15. Tstg. 6,057 ft.

Phillips Pet. Co. No. 2 Rodessa Oil & Land Co., NE SE sec. 13-23-15. Comp.; 217 B.O.P.H. on 3/16-in. tbg. choke; T.D. 6,001 ft.

Standard No. 4 Caldwell, NW cor. SW SE sec. 12-23-16. Drlg. 1,200 ft.

Standard No. 13 Lawton, NW cor. SE SW sec. 14-23-16. Comp. 153 B.O.P.H.; 1⅝-in. tbg. choke; T.D. 6,029 ft.

Standard No. 14 Lawton, SW cor. NW SW sec. 14-23-16. Set 12½-in. 262 ft.; drlg. 5,925 ft.

Standard No. 15 Lawton, SW cor. SW NW sec. 14-23-16. Drlg. 3,959 ft.; (cor.).

Standard No. 16 Lawton, NE cor. SW NW sec. 14-23-16. Drlg. 3,959 ft.; (cor.).

Standard No. 6 Otwell, NE cor. SE SE sec. 15-23-16. Drlg. 4,017 ft.

Standard No. 7 Otwell, SW cor. SE SE sec. 15-23-16. Loc.

Standard No. 8 Otwell, NW cor. SE SE sec. 15-23-16. Loc.

Standard No. 3-A Mattie Pitts, SE cor. SE SW sec. 11-23-16. Cg. 5,979 ft.

Standard No. 2 Zylks, NE cor. SW sec. 10-23-16. Cg. 5,886 ft.

Travis et al No. 1 Raney, 990 ft. W of C sec. 17-23-15. Base Young zone 6,078 ft.; comp.; 10 bbls. distillate per hr. and 15,000,000 ft. gas; T.D. 6,092 ft.

Tri-State O. & G. Co. No. 1 F. L. Westbrook, C Lot 6, Blk. 12, sec. 23-23-16. Drlg. 2,982 ft.

Tri-State-Williams & Peterbaugh No. 1 Ellis, Lot 2, Blk. 20, Townsite, sec. 23-23-16. Set 7-in. 5,955 ft.; T.D. 6,013 ft.; comp. for 7 bbls. distillate per hr. and 5,000,000 ft. gas per day.

United No. 1-574 fee, SE cor. sec. 16-23-16. Loc.

United Gas Pub. Ser. Co. No. 7 Ardis & Co., SW cor. SE SW sec. 14-23-16. Comp. 42 P.O.P.H. on ½-in. tbg. choke; T.D. 6,061 ft.

United No. 3 Brewer Unit, 655 ft. N and 656 ft. E, SW cor. sec. 21-23-16. Drlg. 865 ft.

United No. 4 Brewer Unit, NE cor. 55 ac., sec. 29-23-16. Loc.

United No. 3 Harris, 326 ft. W, 330 ft. N, SE cor. SE SE sec. 15-23-16. Drlg. 3,195 ft.

United No. 2 Harris, NE cor. sec. 15-23-16. Loc.

United Gas Pub. Ser. Co. No. 1 Maroun Unit, 330 ft. S and E, NW cor. sec. 24-23-16. Cmtd. 7-in. 6,044 ft.; T.D. 6,055 ft.

United Gas Pub. Ser. Co. No. 1 McCoy, NE cor. sec. 16-23-16. W.O.C. 3,245 ft.

United Gas Pub. Ser. Co. No. 3 Miller, SW cor. NW NW sec. 14-23-16. Drlg. 5,946 ft.

United No. 2 Mitchell, SW cor. of lse., sec. 29-23-16. Loc.

United No. 5 M. L. Pitts, 312 ft. N and 658 ft. W, SE cor. NW SE sec. 13-23-16. Drlg. 756 ft.

United No. 6 M. L. Pitts, 330 ft. S and 658 ft. W, NE cor. SW SE sec. 13-23-16. Drlg. 3,739 ft.

United No. 7 Pitts, NE cor. SW SW sec. 13-23-16. Loc.

United No. 8 Pitts, SW cor. of E 28 ac., NE SW sec. 15-23-16. Loc.

United Gas Pub. Ser. Co. No. 2 N. S. Spearman Unit, SW NW sec. 18-23-15. Cmtd. 7-in. 6,013 ft.; T.D. 6,030 ft.; comp. 24 B.O.P.H.; ⅝-in. tbg. choke.

United No. 3 N. S. Spearman, SW cor. SE NW sec. 18-23-15. Loc.

United Gas Pub. Ser. Co. No. 3 Thomas Unit, Lots 4 and 5, Blk. 5, Townsite, sec. 23-23-16. Set 7-in. 5,995 ft.; T.D. 6,006 ft.; W.O.C.

United Gas Pub. Ser. Co. No. 4 Thomas Unit, NW cor. NE NW sec. 23-23-16. Cmtd. 7-in. 5,996 ft.; T.D. 6,021 ft.; W.O.C.

United Gas Pub. Ser. Co. No. 5 Thomas Unit, NW cor. SE NW sec. 23-23-16. P.B. to 3,466 ft. to st. hole.

United No. 10 N. S. Tyson Unit, SW cor. SE SE sec. 11-23-16. Drlg. 125 ft.

United Gas Pub. Ser. Co. No. 1 U. S. Govt., sec. 29-23-16. Set 13⅜-in. 350 ft.; cmtd. 7-in. 6,020 ft.; T.D. 6,045 ft.; comp.; 100 B.O.P.H.; ¼-in. tbg. choke.

United Gas Pub. Ser. Co. No. 13 Rodessa Oil & Land Co., SW NE sec. 23-23-16. Comp.; 37 B.O.P.H.; ½-in. tbg. choke; T.D. 6,011 ft.

United Gas Pub. Ser. Co. No. 14 Rodessa Oil & Land Co., NE cor. sec. 23-23-16. Comp.; 50 B.O.P.H.; ¼-in. tbg. choke; T.D. 6,014 ft.

United Gas Pub. Ser. Co. No. 17 Rodessa Oil & Land Co., NW cor. sec. 22-23-16. Set 13⅜-in. 313 ft.; dlg. 5,181 ft.

United Gas Pub. Ser. Co. No. 18 Rodessa Oil & Land Co., SW cor. NE SE sec. 15-23-16. Drlg. 5,404 ft.

United Gas Pub. Ser. Co. No. 19 Rodessa Oil & Land Co., SE cor. NE SE sec. 15-23-16. Drlg. 5,026 ft.

United Gas Pub. Ser. Co. No. 20 Rodessa Oil & Land Co., SE cor. SE NE. Drlg. 5,500 ft.

United Gas Pub. Ser. Co. No. 21 Rodessa Oil & Land Co., NE cor. SE NE sec. 15-23-16. Drlg. 5,583 ft.

United Gas Pub. Ser. Co. No. 22 Rodessa Oil & Land Co., NW cor. sec. 15-23-16. W.O.C.

Sabine Parish—Zwolle

Ellis Prod. Co. No. 1 Williams, 330 ft. S and W, NE cor. SE NE sec. 22-7-11. Tested dry; G.D.; W.O. 2,806 ft.

N. LOUISIANA WILDCATS

Bienville Parish

Rondeau et al No. 1 Locke, 150 ft. S and 1,495 ft. W, NE cor. sec. 9-15-10. Drlg.

A. C. Walters No. 1 D. B. Davis, C SE SW sec. 3-16-9w. Drlg.

Bossier Parish

Geo. H. Bringhurst et al No. 1 Buckley, NE SW sec. 36-21-12. Tested sl.; S.O. Producers O. & G. Co. No. 1 Webb, C W½ SW sec. 22-17-12. Drlg.

Tidwell et al No. 1 Nattin, 200 ft. S and W, C sec. 15-22-14. Set 10-in. 66 ft.; cg. 1,450 ft.

United Gas Pub Ser. Co. No. 1-A A J Murff, NW cor. sec. 17-17-11. Set 7-in. 4,930 ft.; W.O.C. 5,409 ft.

Caddo Parish

Calatex O. & G. Co. No. 1 Hudson, NW SW sec. 8-16-16. O.W.D.D. from 2,970 ft.; drlg. 3,120 ft.

Falcon Oil Co. No. 15 Deckson, NW SE sec. 27-20-15. P.B. 2,342 ft.; old T.D. 2,349 ft.

C. G. Gibson No. 1 Morgan, 800 ft. S and 1,200 ft. W, NE cor. sec. 15-21-16. Tested sl. sh. O. 1,921 ft.; W.O.O.

Juan et al No. 1 Hobbs, NE NE sec. 28-21-15. Comp.; pumping 15 B.O.P.D.; T.D. 1,669 ft.

Kenwood Pool, Ins., No. 1 W. K. Henderson, 1,980 ft. S and 200 ft. E, NW cor. sec. 15-19-15. Loc.

Bill Morefield et al No. 1 Stokely, 745 ft. S and 100 ft. E, C sec. 5-20-16. R.U.

Morris & Wooley No. 1 Pender, NW cor. SW sec. 11-20-15. Set 10-in. 60 ft.; cg. 2,204 ft.

Persian Oil Co. No. 1 J. E. Cupples, 500 ft. S and 350 ft. W, NE cor. sec. 24-16-13. Drlg.

Press & Lambert No. 1 fee, SW cor. NE SE sec. 16-20-15. Drlg. 1,410 ft.

Pyramid O. & G. Co. No. 1-A S. B. Wheeler, 1,320 ft. S. 1,500 ft. W, NE cor. sec. 16-18-16. Cg. 4,881 ft.

Sport Oil Corp. No. 1-D Muslow, SE cor. sec. 5-20-15. Set 9⅝-in.; cg. 2,895 ft.

Caldwell Parish

Critchett & Woods No. 1 Kyles, NE cor. SW NE sec. 13-11-3e. P.B. to 1,360 ft.; old T.D. 1,740 ft.; W.O.O.

Critchett & Woods No. 2 La. Cen. Lbr. Co., NW cor. NW SE sec. 18-11-3e. S.D.; rig repair, 1,002 ft.

Claiborne Parish

E. T. Oakes No. 1 H. W. Patton, NE cor. sec. 1-20-5. Jkd. old hole 4,242 ft.; skd. rig; drlg. 400 ft.

Triangle Drlg. Co. No. 1 Kilpatrick, 466 ft. N and E, C sec. 7-19-5. D.S.T. 1,-000,000 ft. gas, 5,450-5,766 ft.; cmtd. 7-in. 5,497 ft.; T.D. 5,811 ft.; W.O.C.

United Gas Public Service Co. No. 2 Courtett, 660 ft. N and 1,980 ft. E. SW cor. sec. 31-20-5. Gas odors in cores 6,712-25 ft.; drlg. 6,731 ft.

Concordia Parish

Zeni Oil Co. No. 1 Young, 1,200 ft. W, 180 ft. N, SE cor. sec. 28-6n-5e. S.D. 1,120 ft.

De Soto Parish

J. G. Carson No. 1 C. J. McMichael, sec. 36-12-15. Drlg.

A. G. Halbach et al No. 1 Staton, 150 ft. N and E, SW cor. SE sec. 29-13-14. S.D. 4,000 ft.

R. C. Payne No. 1 Harris, NE cor. SW SE sec. 11-13-14. S.D. 1,200 ft.

E. A. Stiller No. 1 Jenkins, 400 ft. S and 200 ft. W, NE cor. NW NE sec. 35-13-12. R.U.

Tarbud Oil Co. No. 1 Caddo Realty Co., SW cor. sec. 2-13-16. Drlg. 1,200 ft.

Franklin Parish

S. C. Jensen No. 1 Bailey, 660 ft. N and W of C sec. 12-11-6e. Drlg. 1,200 ft.

Grant Parish

Acadian Prod. Corp. No. 7 Swope, NE cor. SE SE sec. 15-9-1e. Blg. to test 1,597 ft.

Alexander et al No. 1 Maxwell, sec. 9-9-1e. W.O.S.R. 1,528 ft.

Taw Oil Co. No. 2 Bradford, sec. 16-9-1e. Blg. to test 1,546 ft.

Taw Oil Co. No. 1 Bradford, NE cor. NW sec. 16-9-1e. Set 10-in. 60 ft.; S.D.

La Salle Parish

Montague Oil Co. No. 7-A Zenonia Lbr. Co., NE cor. sec. 10-8-1e. Tested S.W. and W.O. 1,520 ft.

H. T. Taylor No. 7 fee, 120 ft. N and 215 ft. E, SW cor. SW SE sec. 19-10-2e. Tstg. 1,580 ft.

Lincoln Parish

Caldwell Land & Timber Co. No. 1 J. K. Hammons, 330 ft. S and E, NW cor. SE SW sec. 30-18-1w. S.D. 665 ft.

Herman L. Brown et al No. 1 S. Gardner, 330 ft. N, 330 ft. E, SW cor. NW NE sec. 10-17-4w. Schlumberger s. sd. 5,664-71 ft. and 5,678-5,701 ft.; S.D. 5,732 ft.

Morehouse Parish

J. B. Collins et al No. 1 E. M. Clarke, SE NE sec. 10-20-7e. Drlg.

John E. Farrell No. 15 State, 1,208 ft. S and 68 ft. W, NE cor. sec. 28-21-4e. Drlg. 2,000 ft.

John E. Farrell No. 17 State, 1,262 ft. N and 1,739 ft. E, SW cor. sec. 33-21-4e. Drlg. 1,950 ft.

United Gas Pub. Ser. Co. No. 36 Grossett, sec. 15-21-4e. Comp. 10,000,000 ft. gas; T.D. 2,251 ft.

United No. 38 Grossett, sec. 27-21-4e. Comp. 7,000,000 ft. gas; T.D. 2,179 ft.

United No. 20 Tensas, sec. 9-21-4e. Comp. 5,000,000 ft. gas; T.D. 2,152 ft.

United No. 21 Tensas, sec. 10-21-4e. Drlg. 2,045 ft.

Red River Parish

I. J. Allen No. 1 Franklin Realty Co., sec. 20-11-9. Set 12¾-in. 110 ft.; drlg. 2,100 ft.

Byrd Explo. Co. No. 1 Edge, NE¼, SE¼, sec. 29-13-11. R.U.C.T. 2,429 ft.

Byrd Explo. Co. No. 1 Waller, 1,570 ft. N and 1,520 ft. W, SE cor. sec. 20-13-11. Loc.

H. D. Conley et al No. 1 Long Bell Lbr. Co., NE NE sec. 19-13-9. Drlg.

T. G. Shaw No. 1 Teekell, SE cor. SE SW sec. 24-13-10. Loc.

Richland Parish

J. S. Morrisey No. 1 Jones, 1,293 ft. N. 636 ft. E, SW cor. sec. 15-18-7e. S.D. 1,-205 ft.

Arthur Wray No. 1 Slocum, 2,436 ft. S 560 ft. W, NE cor. sec. 10-17-6e. S.D. 1,676 ft.

Sabine Parish

I. J. Allen No. 1 Paul, sec. 24-9-14. R.U.

M. C. Forsman No. 1 Patrick, NE SW sec. 21-9-13. Set 8-in. 75 ft.

F. G. Cox No. 1 Whitney Corp., C NW NE sec. 5-9-13. Drlg. 810 ft.

Posey Sisters Oil Co. No. 2 A. J. Burkett, SW cor. SE NE sec. 10-9-13. Set 10-in. 40 ft.; trtd. acid 1,792 ft.; tstg.

Claude H. Smith No. 1 Whitney Corp., 330 ft. S, 990 ft. W, NE cor. sec. 19-10-13. Set 7-in. 1,514 ft.; S.D. 2,146 ft.

A. H. Tarver No. 2 Baker, NW cor. NE sec. 36-8-12. D.S. stuck 5,200 ft.

J. J. Watson No. 1 Rensaw, NW cor. SE SW sec. 29-9-13. Cmtd. 6-in. 1,540 ft.; tstg. 1,730 ft.; T.D.

Lee Whitehurst No. 2 Latham, sec. 19-9-13. Set 7-in. 1,593 ft.; acid trtd. 2,128 ft.; W.O.O.

Whitehurst & Myers No. 1 Paul, SE cor. SW sec. 24-9-14. Swbg. 1,940 ft.

Windsor Oil Co. No. 1 Cassell, C W½ NW NW sec. 30-1-13. Comp.; flow. 200 B.O. P.D.; T.D. 1,752 ft.

Tensas Parish

H. M. Jones et al No. 1 Chicago Mill & Lbr. Co., NE cor. sec. 30-12-10e. Cg. 760 ft.

Union Parish

Boucher & Pace No. 1 Frost-Johnson, NE NE sec. 27-21-1e. Drlg. 3,420 ft.

Carbons Consd. No. 1 Bird, SW cor. SE sec. 27-22-2e. Set 10-in. 202 ft.; cmtd. 6-in. 2,103 ft.

Southern Carbon Co. No. 9 Grayling, 1,-260 ft. N and 1,954 ft. W, SE cor. sec. 8-21-4e. R.U.

Southern Carbon Co. No. 68 fee, sec. 8-21-4e. Set 6-in. 2,098 ft.; comp. 10,000,-000 ft. gas; T.D. 2,160 ft.

United Gas Pub. Ser. Co. No. 3 Stovall, NE NW sec. 33-21-4e. Cmtd. 6-in. 2,-100 ft.

Vernon Parish

Liane Del Rio Co. No. 2 Gulf Lbr. Co., 1 286 ft. S, 1,000 ft. W, NE cor. sec. 7-1n-9w. S.D. 2,240 ft.

Webster Parish

J. L. Edwards No. 1 Hooper, 330 ft. S and E, NW cor. SW sec. 8-17-9. Pkg. for rotary slip, 2,550 ft.

J. P. Evans et al No. 1 T. Crichton, NE SE sec. 35-18-9. Cg. 5,410 ft.

Ohio Oil Co. No. 1 R. L. Holloway, 660 ft. S, 760 ft. W, C sec. 33-21-10. Drlg. 7,280 ft.

SOUTH LOUISIANA FIELDS

Bayou Mallet—Acadia Parish

Superior O. & G. Co. No. 2 George Bradley, sec. 52-7s-1e. Moving in.

Black Bayou—Cameron Parish

Shell Pet. Corp. No. 31 Watkins, sec. 8-12s-12w. T.D. 5,587 ft.; P.B. to 5,387 ft.; cg. sandstone 5,407 ft.

Shell Pet. Corp. No. 33 Watkins, 65 ft. S cor. sec. 18-12s-12w. Cg. ahead at 4,-623 ft.

Caillou Island—Terrebonne Parish

Texas Co. No. 34 State, sec. 34-22s-22e. Drlg. sd. 5,676 ft.

Texas Co. No. 36 State, T.D. 4,276 ft.; rng. elec. cg. test.

Texas Co. No. 38 State, 7⅝-in. csg. 3,885 ft.; T.D. 3,931 ft.; I.P. 1,187 B.P.D.; ⅝-in. choke.

Cameron Meadows—Cameron Parish

Burton Sutton Oil Co. No. 13 School Land, sec. 16-14s-13w. Cg. sd. at 5,078 ft.

Burton Sutton No. 14 School Land, sec. 16-14s-13w. Drlg.

Burton-Sutton No. 3-A School Land, sec. 16-14s-13w. P.B. and sdtkd.; drlg. sd. 2,951 ft.

Humble-Magnolia No. 16 Cameron Meadows, T.D. 5,326 ft.; to P.B. and test.

Humble-Magnolia No. 17 Cameron Meadows, sec. 21-14s-13w. Drlg.

Cheneyville—Rapides Parish

Texas Co. No. 1 State (Andrade), sec. 5-15s-2e. T.D. 5,703 ft.; prep. to make D.S.T.

Texas Co. No. 1 Weihl, sec. 53-1s-2e. Rig.

Choctaw Dome—Iberville Parish

Standard Oil Co. No. 8 Myrtle Grove Wilburt, sec. 53-9s-11e. T.D. 5,828 ft.; P.B. to 2,450 ft. and sdtkd.; T.D. 4,045 ft.; rmg.

Darrow—Ascension Parish

Humble O. & R. Co. No. 11 Community, sec. 32-10s-2e. Abd. 6,027 ft.

Dog Lake—Terrebonne Parish

Texas Co. No. 3 State, sec. 5-22s-16e. T.D. 7,241 ft.; rng. elec. cg. test.

Four Isle—Terrebonne Parish

Texas Co. No. 5 State, sec. 24-21s-16e. Drlg. sh. 6,067 ft.

Gillis—Calcasieu Parish

Fohs Oil Co. No. 2 Ida Powers, sec. 14-9s-8w. Drlg. sh. and sd. 6,458 ft.

Fohs Oil Co. No. 11 O. H. Castle, sec. 13-9s-8w. R.U.

Texas Co. No. 9 Nickerson fee, sec. 12-9s-8w. Drlg.

Union Sulphur Co. No. 1 J. A. Bel estate. T.D. 7,683 ft.; P.B. to 6,646 ft.; sdtkd. and drlg. at 6,697 ft.

Union Sulphur Co. No. 1 G. S. Cole, sec. 12-9s-8w. T.D. 6,655 ft.; P.B. 3,816 ft.; drlg. sh. at 4,246 ft.

Union Sulphur Co. No. 1 Green Acres, sec. 11-9s-8w. Drlg. wtr. sd. 5,260 ft.

Union Sulphur Co. No. 7 Powell Lbr. Co., sec. 12-9s-8w. T.D. 6,731 ft.; 5-in. csg. 6,726 ft.; I.P. 910 B.P.D.; 24/64-in. choke; T.P. 500 lbs.

Hackberry—Cameron Parish

Calcasieu Oil Co. No. 6 Hansen, sec. 14-12s-10w. T.D. 5,792 ft.; P.B. and stdkd.; drlg. sh. 5,442 ft.

Gulf Ref. Co. No. 20 Irwin, sec. 13-12s-10w. Drlg. L. 3,154 ft.

Stanolind O. & G. Co. No. 16-A School Land, sec. 16-12s-12w. Drlg. sd. and pyrites 4,230 ft.

Stanolind O. & G. Co. No. 21-B Gulf Land, sec. 14-12s-10w. S.D. 6,963 ft.; top salt 6,948 ft.; P.B. and sdtkd.; drlg. sh. and L.

Stanolind O. & G. Co. No. 23-B Gulf Land, sec. 14-12s-10w. Drlg.

Sutton Oil Co. No. 3 Duhon, sec. 22-12s-10w. Drlg. sh. 230 ft.

Texas Co. No. 21 State, sec. 13-12s-10w. Drlg.

Texas Co. No. 19-B State, sec. 13-12s-9w. T.D. 6,724 ft.; P.B. to 4,638 ft.; sdtkd.; drlg. sh. 4,753 ft.

Iowa—Jefferson Davis Parish

Shell Pet. Corp. No. 7 Stafford, sec. 18-9s-7w. T.D. 7,632 ft.; prep. to core ahead.

Shell Pet. Corp. No. 1 Zimmerman. Drlg. oil sd. 4,917 ft.

Jeanerette—St. Mary Parish

Herton Oil Co. No. 2 Banta, sec. 40-13s-9e. Drlg. wtr. sd. 5,883 ft.

Herton Oil Co. No. 3 Banta, sec. 40-13s-9e. Drlg. sh. and L. 4,312 ft.

Herton Oil Co. No. 1 Carter, sec. 33-13s-9e. Drlg. sh. 3,146 ft.

Jennings—Acadia Parish

Fred I. Getty No. 2 Jennings-Clements (W.O.), sec. 46-9s-3w. T.D. 2,300 ft.; tested S.W.; P.B. to 2,176 ft.; prep. to test.

Port City Oil Co. No. 18 Heywood, sec. 41-9s-2w. R.U.

Reid Crude Oil Co. No. 9 Jennings T.D. 2,087 ft.; 7-in. csg. 2,062 ft.; prep. to test.

Shell Pet. Corp. No. 1 Conover, sec. 40-9s-2w. Cg. sd. 6,824 ft.

Stanolind O. & G. Co. No. 14 Houssiere-Latreill, sec. 47-9s-2w. Drlg. sh. 5,752 ft.

Lafitte—Jefferson Parish

Texas Co. No. 4 Lafitte, sec. 20-17s-14e. Drlg. sdy. sh. and L. 3,385 ft.
Texas Co. No. 4 Rigolettes Fur Co., sec. 29-17s-24e. Drlg. sdy. sh. 5,856 ft.

Lake Barre—Terrebonne Parish

Texas Co. No. 37 Lake Barre State. Drlg. sdy. L. 4,002 ft.
Texas Co. No. 39 State, sec. 20-12s-20e. Sh. 3,910 ft.; no report.
Texas Co. No. 40 State, sec. 36-21s-19e. Drlg. rock 1,804 ft.

Lake Hermitage—Plaquemines Parish

Gulf Oil Corp. No. 5 LaFourche Basin Levee Board, sec. 11-18s-25e. Cg. sh. 3,-106 ft.

Leesville—LaFourche Parish

Delta Oil Co. No. 1 Constantine, sec. 34-21s-22e. T.D. 2,422 ft.; fsg.
Lincoln Oil Co. No. 2 Constentine, sec. 27-21s-22e. T.D. 5,133 ft.; salt; I B. 3,-725 ft.; prep. to test.
Texas Co. No. 45 Leesville, sec. 34-21s-22e. T.D. 5,266 ft.; salt; P.B. 3,035 ft.; drld. to 3,333 ft.; set 7⅝-in. csg. at 3,-308 ft.
Texas Co. No. 46 Leesville, sec. 27-21s-22e. T.D. 3,935 ft.; 7⅝-in. csg. 3,896 ft.; I.P. 841 B.P.D.; ½-in. choke T.P. 195 lbs.
Texas Co. No. 47 Leesville, sec. 27-21s-22e. Drlg. sh. 846 ft.

New Iberia—Iberia Parish

Canal Oil Co. No. 3 Sabatier, sec. 54-1s-7e. S.D. 3,180 ft.; in salt.
Kitos Oil Co. No. 2-A Sealey, sec. 56-12s-7e. T.D. 4,560 ft.; prep. to P.B. and set whipstock.
Teche Oil Co. No. 1 Schwing, sec. 52-12s-7e. T.D. 3,876 ft.; prep. to P.B.
Texas Co. No. 1 Smith, sec. 72-12s-7e. Cg. sd. 5,999 ft.

Roanoke—Jefferson Davis Parish

Gulf Oil Corp. No. 2-B Anding, sec. 2-9s-4w. Drlg. sh. 3,305 ft.
Humble O. & R. Co. No. 3 C. N. Taylor, sec. 12-9s-4w. T.D. 8,850 ft.; 7-in. csg. at 8,849 ft.; drlg. plug.
Humble O. & R. Co. No. 4-B Devilbiss, sec. 11-9s-4w. Drlg.
Shell Pet. Corp. No. 5 Kratzer, sec. 12-9s-4w. T.D. 8,681 ft.; 7-in. csg. at 8,668 ft.; prep. to test.

Port Barre—St. Landry Parish

Emerson Corp. No. 4 Sibille, sec. 29-6s-5e. T.D. 3,420 ft.; 7-in. csg. 3,410 ft.; pmpd. 100 B.P.D.; pulled rds. and tbg.; to wash.
Pan American Pred. Co. No. 2 Colmier, sec. 4-6s-5e. R.U.
Texas Co. No. 1 Futral, sec. 26-6s-5e. Drlg. wtr. sd. 5,548 ft.
Texas Co. No. 1 Lahaye, sec. 4-6s-5e. Drlg. sh. 1,260 ft.

St. Martinville—St. Martin Parish

Continental Oil Co. No. 1 fee, sec. 18-11s-6e. T.D. 8,150 ft.; P.B. to 7,370 ft.; to sdtk. and straighten hole.

Sorrento—Ascension Parish

Pan American Prod. Co. No. 4 United land, sec. 15-10s-4e. T.D. 4,332 ft.; 7-in. csg. at 4,291 ft.; comp. for gas well; T.P. 1,668 lbs.; C.P. 1,725 lbs.
Sorrento Oil Co. No. 1 Bernard, sec. 9-10s-4e. Derrick.

Sulphur—Calcasieu Parish

Union Sulphur Co. No. 324 fee, sec. 20-9s-10w. T.D. 4,526 ft.; P.B. 2,825 ft.; drlg. sh. 3,547 ft.

Tepetate—Acadia Parish

Continental Oil Co. No. 1 Hugh Breckenridge, sec. 29-7s-2w. Drlg. sh. and shells 7,268 ft
Continental Oil Co. No. 1 Doris Fruge, sec. 28-7s-2w. R.U.
Continental Oil Co. No. 1 P. Johnson, sec. 30-7s-2w. Drlg. sh. 5,095 ft.
Continental Oil Co. No. 1 Sonnier, sec. 29-7s-2w. T.D. 8,317 ft.; I.P. 296 bbls. in 13 hrs.; C.P. 2,400 lbs.; T.P. 2,100 lbs.
Continental Oil Co. No. 2 L. L. Welch, sec. 28-7s-2w. Drlg.
General Crude Oil Co. No. 1 Vincent, sec. 31-7s-2w. Drlg. sh. 8,554 ft.
Loffland Bros. No. 1-A L. C. Bowles, sec. 28-7s-2w. Abd. at 8,378 ft.
Loffland Bros. No. 1-B L. C. Bowles, sec. 28-7s-2w. Abd. 8,703 ft.

Vinton—Calcasieu Parish

Vinton Pet. Co. No. 1 fee, sec. 34-10s-13w. T.D. 1,500 ft.; W.O.C.
Wilson Broach No. 19 Wilson Strip, sec. 33-10s-12w. T.D. 4,430 ft.; prep. to drill ahead.

White Castle—Iberville Parish

Shell Pet. Corp. No. 3 Shingle, 650 ft. S. 600 ft. E of NW cor. sec. 12-11s-12e. Drlg. sd. 5,485 ft.

S. LOUISIANA WILDCATS

Acadia Parish

Magnolia Pet. Co. No. 1 Homeseekers Dev. Co., sec. 54-10s-1w. Drlg. sh. 7,026 ft.

Allen Parish

Humble O. & R. Co. No. 1 J. A. Bell, sec. 28-6s-7w. Drlg. sh. 6,577 ft.

Avoyelles Parish

Frost Oil Co. No. 1 Hinds Lbr. Co., sec. 3-3n-4e. R.U.

Cameron Parish

Magnolia Pet. Co. No. 1 Hebert, sec. 13-12s-9w. Drlg. sh. and L. 6,216 ft.

East Feliciana Parish

East Feliciana Oil Co. No. 1 Rider, sec. 58-1s-1w. Drlg.

Iberia Parish

Jefferson Lake Oil Co. No. 1 State, Twp. 12s-5e. T.D. 8,610 ft.; P.B. to 8,483 ft.; perf. from 8,460-66 ft.; prep. to test.
Jefferson Lake Oil Co. No. 322 State Lake Piegneur, S.D. 5,690 ft.
Texas Co. No. 2 State, sec. 35-11s-8e. Driving piling.

Jefferson Davis Parish

Shell Pet. Corp. No. 1 Lacassan, sec. 20-11s-5w. T.D. 9,498 ft.; pipe stuck; S.G.

Livingston Parish

Bunte O. & G. Co. No. 1 Addison Trust Co., sec. 7-7s-3e. Drlg.

St. Bernard Parish

John Cartwright No. 1 Meraux Nunez, sec. 19-13s-12e. Drlg.

St. James Parish

Pan American No. 2 Cormier, sec. 4-6s-5e. R.U.
Shell Pet. Corp. No. 1 Colonial Sugar, sec. 5-12s-5e. Drlg. sdy. L. 6,876 ft.

St. Landry Parish

Limited Oil Co. No. 1 Miller Est., sec. 47-3s-4e. Drlg. sh. 7,580 ft.

St. Martin Parish

Southern Oil (S. C. Yingling et al) No. 1 State, sec. 13-9s-3w. T.D. 3,172 ft.; tested S.W.: pulling csg. to deepen.
Texas Co. No. 2 State, sec. 14-10s-9e. Drlg. sh. 805 ft.
Texas Co. No. 8 St. Martins Land, sec. 17 8s-7e. T.D. 8,213 ft.; D.S. stuck; shot off at 5,050 ft.; now pulling.
S. C. Yingling et al No. 2 State, sec. 13-9s-3w. Driving piling.

Terrebonne Parish

Humble O. & R. Co. No. 1 Continental Land & Fur Co., sec. 30-17s-14e. Bldg. drk.

Vermillion Parish

Continental Oil Co. No. 1 O. C. Hebert, sec. 20-12s-3e. Drlg. sh. 5,678 ft.
Louisiana Land & Expl. Co. No. 1 La. Fur Co., sec. 16-15-1e. Drk.

TEXAS

Week Ending May 9

GULF COAST FIELDS

Raccoon Bend—Austin County

Humble O. & R. Co. No. 9 Wilson, Wm. Harvey Sur. T.D. 4,100 ft.; 7-in. csg. at 4,031 ft.

Hastings—Brazoria County

Humble O. & R. Co. No. 2-B Cannon, H. T.&B. Sur. Drlg. sh. 5,770 ft.
Stanolind O. & G. Co. No. 1 J. W. Miller, A.C.H.&B. Sur. No. 2. T.D. 6,066 ft.; 7-in. csg. at 5,996 ft.; I.P. 550 bbls. in 22½ hrs.; ¼-in. choke: T.P. 1,200 lbs.; C.P. 1,175 lbs.
Stanolind O. & G. Co. No. 1 Brown, H.T. &B. Sur. T.D. 130 ft.; W.O.C.
Stanolind O. & G. Co. No. 2 Brown, H.T. &B. Sur. No. 28. T.D. 6,080 ft.; 7-in. csg. at 5,859 ft.; I.P. 612 B.P.D.; ¼-in. choke; T.P. 900 lbs.; C.P. 925 lbs.
Stanolind O. & G. Co. No. 3 Cannon, H. T.&B. Sur. No. 26. T.D. 5,853 ft.; rng. 7-in. csg.
Stanolind O. & G. Co. No. 1 Jimmie Sneed, Jimmie Sneed Sur. T.D. 6,080 ft.; I.P. 219 bbls. in 10 hrs.; ¼-in. choke; T.P. 725 lbs.
Stanolind O. & G. Co. No. 5 B. L. Turner, A.C.H.&B. Sur. No. 1. T.D. 1,840 ft.; 10¾-in. csg. at 1,811 ft.
Stanolind O. & G. Co. No. 4 Williams, A.C.H.&B. Sur. No. 1. Cg. sd. and sh. 6,030 ft.
Stanolind O. & G. Co. No. 4 Wooster, A. C.H.&B. Sur. No. 1. Drlg. sh. and L. 3,-765 ft.

Old Ocean—Brazoria County

Harrison & Abercrombie No. 1 Armstrong Plantation fee, Polly and Chance Sur. Moving in.

Manvel—Brazoria County

Texas Co. No. 22 Houston Oil Field Assn., A.C.H.&B. Sur. No. 1. Drk.
Texas Co. No. 2 Smith, H.T.&B. Sur. Drlg. clay and sd. 566 ft.
Texas Co. No. 22-B Belcher, H. N. Little Sur. Drlg. sh. 4,332 ft.
Texas Co. No. 23-B Belcher, H. N. Little Sur. Drlg. sh. and L. 2,662 ft.
Uscan Oil Co. No. 1 Wilson, H.T.&B. Sur. No. 23. T.D. 4,030 ft.; P.B. to 4,000 ft.; 7-in. csg. 4,015 ft.; I.P. 455 B.P.D.; ¼-in. choke; T.P. 300 lbs.; C.P. 700 lbs.

Anahuac—Chambers County

Humble O. & R. Co. No. 5 Broussard & Hebert, H.T.&C. Sur. Drlg. sh. 1,527 ft.
Humble O. & R. Co. No. 10 Clark, H.&T. C. Sur. T.D. 7,082 ft.; 7-in. csg. at 7,-042 ft.; I.P. 28.39 B.P.H.; ½-in. choke; T.P. 1,100 lbs.
Humble O. & R. Co. No. 12 Engels, sec. 50, H.&T.C. Sur. T.D. 7,082 ft.; T.S. 7,-016 ft.; I.P. 28 B.P.H.; ¼-in. choke; T.P. 900 lbs.; C.P. 1,025 lbs.
Humble O. & R. Co. No. 2 Grippon, H.&T. C. Sur. T.D. 7,095 ft.; 7-in. csg. at 7,-060 ft.; I.P. 19 B.P.H.; ½-in. choke; T.P. 685 lbs.
Humble O. & R. Co. No. 3 Johnson, H.&T. C. Sur. Drlg. sh. 2,600 ft.
Humble O. & R. Co. No. 16 Middleton, sec. 58. T.D. 1,543 ft.; 10¾-in. csg. at 1,517 ft.; W.O.C.
Humble O. & R. Co. No. 4 Zappe, H.T.& C. Sur. Drlg. sh. and L. 4,388 ft.
Humble O. & R. Co. No. 2 Tyrell, H.&T. C. Sur. T.D. 7,085 ft.; I.P. 27 B.P.H.; ¼-in. choke; T.P. 800 lbs.
Humble O. & R. Co. No. 9 White, James McGahey Sur. T.D. 7,107 ft.; 7-in. csg. at 7,090 ft.; I.P. 11 B.P.H.; ¼-in. choke; T.P. 450 lbs.
Humble O. & R. Co. No. 10 White, James McGahey Sur. T.D. 1,680 ft.; 10¾-in. csg. at 1,512 ft.
Sun Oil Co. No. 13 White, James McGahey Sur. Drlg. sh 6,938 ft
Sun Oil Co. No. 14 White, James McGahey, Sur. T.D. 7,087 ft.; rmg. to run csg.
Sun Oil Co. No. 15 White J. McGahey Sur. Drk.
Sun Oil Co. No. 18 White, J. McGahey Sur. Drk.

Barbers Hill—Chambers County

Sinclair Prairie No. 19 Wilburn, Henry Griffith Sur. T.D. 5,303 ft.; I.P. 550 B. P.D.; ¼-in. choke; C.P. 560 lbs.
Stanolind O. & G. Co.'s No. 29 Chambers Wm. Bloodgood Sur. Derrick.

Cotton Lake—Chambers County

Salt Dome Oil Co. No. 1 A. B. Lawrence, Solomon Barrow Sur. Drk.
Salt Dome Oil Co. No. 2 Lawrence, T.D. 7,003 ft.; P.B. to test Marginulina sd. around 6,600 ft.

Turtle Bay—Chambers County

Stanolind O. & G. Co. No. 2 Middleton, M. A. Carroll Sur. T.D. 6,609 ft.; 7-in. csg. at 6,597 ft.; screen sanded up: reset: now swbg.
Stanolind O. & G. Co.-State No. 1 Turtle Bay. T.D. sdtkd. hole 6,618 ft.; 7-in. csg. at 6,606 ft.; I.P. 155 B.P.D.; ¼-in. choke; T.P. 140 lbs.; C.P. 760 lbs.
Stanolind O. & G. Co. No. 2 State, Drlg. sh. 1,852 ft.

Big Creek—Fort Bend County

Gulf Oil Corp. No. 68 Davis, M. Young Sur. T.D. 4,529 ft.; I.P. 75 B.P.D.; .4% wtr.
Gulf Oil Corp. No. 69 Davis, B. Young League. R.U.

Blue Ridge—Fort Bend County

Ben Barnett No. 2 Blakely, E. Drew Sur. T.D. 208 ft.; W.O.C.
Mills Bennett No. 4 Luscher, T. Habermacher Sur. Abd. 5,319 ft.
Trans State Oil Co. No. 3 Blakely, E. Drew Sur. T.D. 3,975 ft.; I.P. 600 B.P. D.; T.P. 400 lbs.
D. M. Wallace and Woodley Pet. Co. No. 2 Blakely, E. Drew Sur. T.D. 3,983 ft.; P.B. and drlg. sh. at 3,785 ft.

Orchard—Fort Bend County

Gulf Prod. Co. No. 44 Moore, Leo Burknapp Sur. Sh. 6,020 ft.; S.D.
Gulf Oil Corp. No. 46 Moore, Leo Burknapp Sur. Drlg. gbo. 114 ft.

Thompson—Fort Bend County

Sterling O. & R. Co. No. 1 F. I. Booth, H. Chrisman Sur. Drlg. sh. 4,100 ft.

High Island—Galveston County

Stanolind O. & G. Co. No. 5 B.&N.O., Fitzsimmons Sur. T.D. 6,477 ft.; P.B. 5,795 ft.; 7-in. csg. at 5,755 ft.; P.B. to 5,735 ft.; perf. 5,760-80 ft.; flowed 590 bbls. fluid, 50% S.W.; S.D.
Stanolind O. & G. Co. No. 55 Cade, Wm Hudson Sur. T.D. 5,136 ft.; swbd. 180 B. P.D.; reran screen and lnr.
Stanolind O. & G. Co. No. 56 Cade, N. Fitzsimmons Sur. R.U.
Stanolind O. & G. Co. No. 1 Cooper, M. Dunman Sur. R.U.
Stanolind Oil & Gas Co. No. 18 R. Smith Royalty, M. Dunman Sur. Drlg. sh. 5,-530 ft.

Dickinson—Galveston County

Humble O. & R. Co. No. 3 E. E. Townes, J. S. Jones Sur. T.D. 6,605 ft.; fsg.
Humble O. & R. Co. No. 2-B Bayou Dev Co., J. Sellers Sur. T.D. 9,107 ft.; P.B. to 8,270 ft.; 7-in. csg. at 8,255 ft.; abd.
Humble O. & R. Co. No. 3-B Bayou Dev. Co., J. Sellers Sur. Moving in.
Humble O. & R. Co. No. 7-B Stewart, John Sellers Sur. Drlg. sh. 6,298 ft.
Ken Ben Oil Co. No. 1 Stewart, W. K. Wilson Sur. Drlg. sh. 6,340 ft.
Pure Oil Co. No. 3 Shelar, B.B.B.&C. Sur. T.D. 8,052 ft.; 7-in. csg. 8,025 ft.; swbd. fluid level at 3,000 ft.; 1,300 lbs. gas pressure; prep. to W.O.
Stanolind O. & G. Co. No. 4 State, Tr. No. 3. Drlg. sh. and shells 4,767 ft.
Stanolind O. & G. Co. No. 5 State, Tract 3. Drlg. sh. 7,643 ft.

Batson—Hardin County

Nimrod Prod. Co. No. 1 Butler, W. Donoho Sur. Drlg. sh. 1,350 ft.

Saratoga—Hardin County

John Deering No. 1 Teel, Thomas Gaines Sur. Drlg. sh. 1,430 ft.

Humble—Harris County

Texas Co. No. 273 Landslide, R. D. Usman Sur. Drlg. sd. and sh. 2,871 ft.

Pierce Junction—Harris County

Gulf Oil Corp. No. 3 Manchester, J. A. Williams Sur. T.D. 4,250 ft.; I.P. 360 B.P.D.; ⅝-in. choke.

Mykawa—Harris County

West Prod. Co. No. 9 Irwin, W. B. Walker Sur. T.D. 4,985 ft.; P.B. and sdtkd.; drlg. at 3,190 ft.
West Prod. Co. No. 1 Minnetex, Wm. Lovett Sur. Drlg. sh. 3,600 ft.

South Houston—Harris County

Dick Schwab No. 1 T. Bennett, H.T.&B. Sur. No. 6. T.D. 4,776 ft.; I.P. 410 B. P.D.; ¼-in. choke; T.P. 300 lbs.; C.P. 700 lbs.
Smith & McDannald No. 1 Phillips, H.T. &B. Sur. No. 6. Drlg. sdy. sh. 3,605 ft.
Stanolind O. & G. Co. No. 1 Funk, Callahan & Vince Sur. Drlg. L. and sh. at 2,450 ft.
Stanolind O. & G. Co. District No. 23, H. T.&B. Sur. No. 5. Drlg. sh. 1,573 ft.
Stanolind O. & G. Co. No. 1 Schwartz, H.T.&B. Sur. No. 6. Drlg. sh. 3,879 ft.
Stanolind O. & G. Co. No. 2 Schwartz, H. T.&B. Sur. R.U.

Tomball—Harris County

Humble O. & R. Co. No. 1 Holderrath, C. N. Pillot Sur. T.D. 5,559 ft.; 7-in. csg. at 5,552 ft.; I.P. 24 B.P.H.; ¼-in. choke; T.P. 875 lbs.; C.P. 950 lbs.
Humble O. & R. Co. No. 2 Laird, C. N. Pillot Sur. Drlg. sdy. sh. 2,993 ft.
Humble O. & R. Co. No. 2 Mahaffey, J. Pruitt Sur. T.D. 5,552 ft.; 7-in. csg. at 5,546 ft.; comp.; no gauge.
Humble O. & R. Co. No. 1 Wilson, Ralph Hubbard Sur. Drlg. sh. 5,355 ft.
Humble O. & R. Co. No. 10-B Quilter, A. Senschall Sur. Drlg. 200 ft.

Maurits—Jackson County

Shell Pet. Corp. No. 2 C. F. Combs, Morris & Cummings Sur. Abd. 5,852 ft.

Amelia—Jefferson County

Humble O. & R. Co. No. 1 Guinn, C. Williams Sur. T.D. 6,776 ft.; 7-in. csg. at 6,760 ft.; I.P. 22 B.P.H.; ¼-in. choke.
Humble O. & R. Co. No. 2 Guinn, C. Williams Sur. Drlg.
Humble O. & R. Co. No. 1 Pinchback, C. Williams Sur. Drlg. sh. 5,760 ft.

Big Hill—Jefferson County

Stanolind O. & G. Co. No. 3-A Pipkin and Davis, Wm. McFaddin Sur. Drlg. sh. 5,493 ft.

Fannett—Jefferson County

Gulf Oil Corp. No. 18 Thomas, W. H. Smith Sur. Drlg. sh. 5,557 ft.

Cleveland—Liberty County

Gulf Oil Corp. No. 15-C Cleveland, J. Pleasant Sur. Drk.

Esperson—Liberty County

Crown Pet. Co. No. 1 Davis, D. Kokernot Sur. Abd. 6,359 ft.
General Crude Oil Co. No. 15 Davis, D. L. Kokernot Sur. T.D. 3,585 ft.; 7-in. csg. at 3,573 ft.
General Crude Oil Co. No. 27 Esperson, Kokernot Sur. Cg. sh. 2,468 ft.

Hankamer—Liberty County

Gulf Oil Corp. No. 24 Boyd, Amos Allen Sur. Drlg. sd. 5,015 ft.
Gulf Oil Corp. No. 6 Crow and Jacobs, H.T.&C. Sur. No. 21. T.D. 5,380 ft.; P.B. to 3,675 ft.; drlg. sd. 3,951 ft.
Uscan Oil Co. No. 5 Essell, Levi Borrow Sur. Drlg. sh. 2,830 ft.

Hardin—Liberty County

Atlantic Oil & Prod. Co. et al No. 1 Hardy, James Robinson Sur. T.D. 8,110 ft.; D. S.T. made S.W.; P.B. to 7,775 ft.; to make another test.

Hull—Liberty County

Gulf Oil Corp. No. 112 Phoenix, J. Devore Sur. R.U.
Republic-Houston No. 160 Dolbear, J. Devore Sur. M.I.R.

Markham—Matagorda County

Hamill & Hamill No. 1 Poor Boy Smith, H. Parker Sur. R.U.

Van Vleck—Matagorda County

Skelly Oil Co. No. 1 Langham, M. Cummings Sur. T.D. 7,505 ft.
Skelly Oil Co. No. 2 Metzler, M. Cummins Sur. Moving in.
Skelly Oil Co. No. 1 Rugelsey, I.&G.N. Sur. No. 267. Drlg. sdy. sh. 5,359 ft.
Skelly Oil Co. No. 4-B Kobb, M. Cummings Sur. Drlg. sh. and sd. 5,765 ft.

Conroe—Montgomery County

Humble O. & R. Co. No. 79-A South Tex. Dev. Co., Theo. Slade Sur. Drlg. sh. and L. 4,337 ft.
Sun Oil Co. No. 26 Foster, T.D. 5,122 ft.; 7-in. csg. at 5,018 ft.; W.O.C.

Splendora—Montgomery County

Tide Water Oil Co.-Darby Pet. Co. No. 1 W. C. and Ella Corbett, Josiah Blackman Sur. Spudded.

Orange—Orange County

Texas Canadian Oil Co. No. 1 Bland. James Dyson Sur. Drlg. sh. 6,340 ft.

Port Neches—Orange County

Texas Co. No. 6-B Polk. J. Beaumont Sur. T.D. 6,952 ft.; T.D. sdtkd. hole 4,966 ft.; drld. to 5,402 ft.; stuck pipe at 5,131 ft.; shot; now pulling.

Greta—Refugio County

Hewitt & Daugherty No. 23 Lambert, Hardwick Sur. T.D. 5,919 ft.; 7-in. csg. 5,849 ft.; W.O.C.

United Gas Co. No. 24 Lambert-Hardwick Sur. Cg. sh. 5,267 ft.

Refugio—Refugio County

D. & D. Oil Co. No. 3, Heard townsite. T.D. 4,330 ft.; fsg.

United Gas Co. No. 12 Fannie Heard, Refugio townsite, Drk.

United Gas Co. No. 17 Fox Hews Survey T.D. 6,359 ft.; 5-in. csg. 6,245 ft.; tested S.W.; recmtd.: P.B. to 4,995 ft.; W.O.C.

United Gas Co. No. 7 Ryalls, Refugio townsite. 10-in. csg. 517 ft.; W.O.C.

Tomoconnor—Refugio County

Quintana Pet. Co. No. 35-A Tom O'Connor, Swisher Sur. Spudded.

Quintana Pet. Co. No. 1-C Tom O'Connor, Carr & Connell Sur. Sh. 230 ft.

Colette Creek—Victoria County

American Liberty Oil Co. No. 3 Gaughler, R. Manchola Sur. T.D. 2,880 ft.; 7-in. csg. at 2,857 ft.; I.P. 160 B.P.D.; ¼-in. choke; gas lift.

American Liberty Oil Co. No. 4 Machalic R. Manchola Sur. Drlg. sh. 580 ft.

Keeran—Victoria County

Gulf Oil Corp. No. 8 Keeran, DeLeon Sur. Drlg. sh. and L. 5,483 ft.

Placedo—Victoria County

Barnsdall-Costa No. 3 Wheless, S.A.&M.G. Sur. No. 8. T.D. 4,763 ft.; 7-in. csg. at 4,752 ft.; I.P. 225 bbls. in 16 hrs.; ¼-in. choke; T.P. 585 lbs. C.P. 560 lbs.

Barnsdall-Costa Oil Co. No. 4 Wheless, S.A.&M.G. Sur. No. 8. Drlg. sh. 662 ft.

Barnsdall-Costa Oil Co. No. 2 Wright, S. A.&M.G. Sur. R.U.

Benson-Jones No. 1 J. A. Janis, W. Rupley Sur. T.D. 4,744 ft.; set 7-in. on bottom; I.P. 132 B.P.D.; 3/16-in. choke; T.P. 375 lbs.; C.P. 925 lbs.

Benson & Jones No. 2 J. A. Janis, Wm. Rupley Sur. Drk.

Crown Central Oil Co. No. 2 Gebrover, J. M. Bronson Sur. T.D. 4,764 ft.; P.B. to 4,447 ft.; W.O.C.

Harrison & Abercrombie No. 1 L. O. Sturdevant, S.A.&M.G. Sur. T.D. 4,764 ft.; 7-in. csg. at 4,742 ft.

Sun Oil Co. No. 2 Schneeder, Wm. Rupley Sur. T.D. 4,767 ft.; 7-in. csg. at 4,759 ft.

Clay Creek—Washington County

Sun Oil Co. No. 1 H. Lauter, N. Clay Sur. Drlg. sh. 3,815 ft.

Louise—Wharton County

Pure Oil Co. No. 1 Cochran, M.&C. Sur., sec. 29. Drlg. sh. 875 ft.

Pure Oil Co. No. 4 McIntyre, Morris-Cummings Sur. Drlg. sd. 5,096 ft.

Pickett Ridge—Wharton County

Adrian Moore No. 1 W. P. Wilbeck, J. Tele Forimer Sur. Moving in.

Crown Central Pet. Co. No. 1 J. J. Rad, W.C.R.R. Sur. Drk.

Texas Co. No. 2 Marek, George Reynolds Sur. Drlg. sd. and sh. 4,822 ft.

Texas Co. No. 14-A Pierce, **L.&G.N. Sur. No. 29.** T.D. 4,709 ft.; perf. 4,698-4,709 ft.; I.P. 18 B.P.D.; ¼-in. choke.

Texas Co. No. 17-A Pierce, L.&G.N. Sur. T.D. 4,709 ft.; 7-in. csg. at 4,697 ft.; I.P. 14 B.P.H.; ¾-in. choke; T.P. 1,275 lbs.; C.P. 1,675 lbs.

Texas Co. No. 18-A Pierce, L.&G.N. Sur. T.D. 4,713 ft.; 7-in. csg. 4,702 ft.; I.P. 17 B.P.H.

Texas Co. No. 19-A Pierce, L.&G.N. Sur. No. 28. Bldg. drk.

Texas Co. No 20-A Pierce, L.&G.N. Sur. R.U.

Withers—Wharton County

Texas Co. No. 1-B Pierce, **E.T. R.R. Sur.,** Abst. No. 168. Drlg. sd. 5,973 ft.

Texas Co. No. 4-C Pierce, J. Caldwell Sur. T.D. 5,560 ft.; 7-in. csg. at 5,551 ft.; I.P. 14 B.P.H.; T.P. 425 lbs.; C.P. 600 lbs.

Texas Co. No. 5-C Pierce, C. J. Caldwell Sur. T.D. 5,567 ft.; 7-in. csg. at 5,555 ft.; rng. tbg.

Texas Co. No. 6-C Pierce, J. Caldwell Sur. R.U.

Texas Co. No. 7-C Pierce, J. Caldwell Sur. Drk.

GULF COAST WILDCATS

Brazoria County

Gulf Oil Corp. No. 1 Fairfield, A. Robinson Sur. T.D. 8,398 ft.; flowed gas, S.W., mud; killed well; prep. to fish for D.S.

Stanks Oil Corp. et al No. 1 D. K. Poole J. W. Hardin Sur. T.D. 3,700 ft.; fsg.

Texas Co. No. 3 Freeport Sulphur Co., C. Arcola Sur. 13⅜-in. csg. 3,990 ft.; conditioning mud; prep. to drill ahead.

Texas Gulf Prod. Co. No. 1 Sparks. Drgl. sh. 5,056 ft.

Chambers County

Glenn H. McCarthy No. 1 Pitt, J. M. Duran Sur. Drlg. sh. 6,496 ft.

Calhoun County

Continental Oil Co. No. 1 T. Vandenberg, sec. 12, Blk. H. Moving in.

Humble O. & R. Co. No. 2 Welder, Jose Maria Rios Sur. No. 1. T.D. 5,474 ft.; rng. 7-in. csg.

Colorado County

Terminal Oil Products Co. No. 1 R. S. Gillis, M. Middleton Sur. Drlg. rock 2,592 ft.

Fayette County

Ben G. Barnett No. 1 McKinnon, A. Zumwalt Sur. T.D. 3,140 ft.; S.D.

Galveston County

Coastal Mineral Dev. Co. No. 1 Joslin, Sarah McKissick Sur. Drlg. sh. 6,397 ft.

Sun Oil Co. No. J. D. Hughes, W. M. C Baker Sur. T.D. 8,613 ft.; milling at 8,383 ft.

Grimes County

Crook Bros. No. 1 W. W. and J. C. Greir. Drlg. sh. 1,725 ft.

Hardin County

Jack Frazier No. 1-A Olive Sternberg, J. Houston Sur. Abd. 7,001 ft.

S. Hindman No. 1 Howth, A. J. Cotton Sur. S.D. 3,967 ft.

David B. MacDaniel No. 1 Nona Mills, E. E. Manvel Sur. Drlg. sh. 6,300 ft.

Harris County

Amerada Pet. Corp. et al No. 1 Donsiout C.W.R.R. Sur., Blk. 1, sec. 2. Drlg. sh. 5,165 ft.

Bunte O. & G. Co. No. 1 Lobit et al, Benjamin Barrow Sur. Drk.

Jefferson County

Magnolia Pet. Co. No. 1 Punches, sec. 16, H.T.&B. Sur. Drlg. sh. 7,510 ft.

Sun Oil Co. No. 1 Herbert & Broussard, B. Blackman Sur., Abst. No. 2. T.D. 8,824 ft.; drlg. sh. in stdkd. hole 7,651 ft.

Lavaca County

Goode et al No. 1 J. H. Staffa, W. R. Hensley Sur. S.D. 2,671 ft.

Matagorda County

Continental Oil Co. No. 1 Feltz, J. S Criswell Sur. T.D. 7,629 ft.; abd. at 6,123 ft.

John Deering No. 1 Estelle, Tone and Jameson Sur. T.D. 6,868 ft.; shot csg. 3,700 ft.

Heimerich & Payne, No. 1 Hawkins, D. McCarthy Sur. T.D. 7,816 ft.; P.B. to 3,502 ft.; set whipstock at 3,023 ft.; milling at 3,004 ft.

Sun Oil Co. No. 1 Craig, Thomas Williams Sur. T.D. 6,218 ft.; put in cmt. plug from 5,901-6,601 ft.; W.O.C.

Montgomery County

Chapman and Smith No. 1 Delta Land & Timber Co., T. Shepperd Sur. No. A-488. S.D. 4,980 ft.

Mid-Texas Oil Co. No. 1 Security Trust, G. W. Loonin Sur. Cg. sh. 4,320 ft.

Wm. Thompson et al No. 2 Scott, F. A. Wheeler Sur. Abd. 3,685 ft.

Tyler County

McArthur & Mixon No. 1 D. D. Kountz, J. A. Honkins Sur. Moving in.

Victoria County

Rowan-Hope No. 1 Scheel, J. M. Escallera Sur. Drlg. sh. 5,850 ft.

Wharton County

Pure Oil Co. No. 1 Paige, James Pirie Sur. T.D. 9,200 ft.; perf. 7,680-7,700 ft.; cutting 6⅝-in. csg.; to test again.

Smith & McDannald No. 1-A Priesmeyer, Charles Riley Sur. Moving in.

S. W. TEXAS WILDCATS

Aransas County

Buckingham Oil Co. No. 1 McCampbell, sec. 41-42, James Arids Sur. T.D. 7,501 ft.; recovering 6,200-ft. pipe.

Atascosa County

Atascosa Trust No. 1 Domsch, 160 ft. S line, 380 ft. E line, 152-ac. lease, J. T Russell Sur. 1,222. Cd. sat. 3,487-3,500 ft.; cg. deeper; to set csg.

Bee County

J. F. Haworth No. 1 Copeland, 330 ft. N line, 2,100 ft. E line, O. Marshall Sur. Drlg. 2,315 ft.

Howeth & Singer No. 1 Voss, 990 ft. NW line, 330 ft. SW line, S. May Sur. Loc.

Marine Oil Co. No. 1 Ray, 360 ft. E line, 330 ft. N line, 40-ac. tr., Anna Birks Sur. Drlg. 4,127 ft.

Nichols & Quinn No. 1 Scott, Blk. 7, J. Molina Sur., Uranga grant. Loc.

Brooks County

California Co. No. 1 B. Garcia, 465 ft. W and W lines lease, B. Garcia tract, Salinas Sur. Cg. 6,310 ft.

Duval County

Atlantic Oil Prod. Co. and Darby Pet. Corp. No. 1-F Welder, 2,310 ft. N and E lines, Sur. 552. Drlg. 2,292 ft.

Cabildo Oil Corp. No. 1 Tinney, Sur. 3. T.D. 4,004 ft.; D.&A.

C. G. Glasscock No. 1 Milano Land & Garden Co., Sur. 87. G.W. sd. 2,970-3,073 ft.; show S.W.; Loma Novia sd. 3,092-3,160 ft.; S.W. and S.O.

Frank Gravis No. 1 C. K. Gravis, 1,450 ft SE line, 990 ft. SW line, Sur. 250. Cg. 5,110 ft.

Hamil & Smith No. 1 Hubbard, sec. 69. Drlg. 2,767 ft.

Kepley Prod. Co. No. 1 Sevier, 330 ft. S line, 1,320 ft. E line, Sur. 71. T.D. 3,410 ft.; P.B. 3,233 ft.; W.O.C.

Magnolia Pet. Co. No. 1 Gray ranch, 330 ft. S and E lines, Sur 556. T.D. 3,949 ft.; D.&A.

Rio Bravo Oil Co. No. 1 Peters, 330 ft. S and E lines lse., Sur. 397. Sd. 1,807-12 ft.; S.O.&G. D.S.T.; 1,809-12 ft.; 80 ft. mud cut with oil and gas in 18 min.

Santa Clara Oil Co. (Atallah & O'Neil) **No. 1 W. Serna, 330 ft. S and E lines,** sec. 521. T.D. 1,323 ft.; S.D. wtr.

Windsor Oil Co. No. 2 Peters, Sur. 33. R.U.

Edwards County

Paul Teas No. 1 Stewart, C SE¼ **sec. 3,** G.C.&S.F. Sur. S.D. 5,270 ft.

Goliad County

Cotton Belt O. & G. Co. No. 1 Lutenbacher, 330 ft. S and W lines, Blk. 25, Goliad townsite. T.D. 4,550 ft.; D.&A.

Magnolia Pet. Co. No. 1 Tipton, 330 ft. SE and SW lines, Thorman Sur. T.D. 4,643 ft.; D.&A.

Zeni Oil Co. No. 2 Luten Bacher, 330 ft. W line, 1,330 ft. N line, Blk. 25, Goliad townsite, Skidding on.

Guadalupe County

Paul Armstrong and J. E. Clark No. 1 Brodnaux, 150 ft. SE cor. 36-ac. tr., King Sur. Sd. 2,397-2,425 ft.; tested S. W.; stdg.

J. E. Clark No. 1 Anderson, Green De Witte Sur. Drlg. 1,820 ft.

J. E. Clark No. 1 Williams, DeWitte Sur. Cg. shells 2,360 ft.

Hidalgo County

Gerald O. & G. Co. No. 1 Nelson Mortgage Co., Blk. 38, Lot A, LaDonna Tr. Drlg. sh. 3,847 ft.

Gulf States Oil Co. No. 3 John Engleman, Lot 3, Blk. 70. Sd. 6,671-6,730 ft.; gas 6,703-29 ft.; some sat. set csg. 6,800 ft.; W.O.C.

Helen K. Maxwell No. 1 Hidalgo Wtr. Dist. No. 2, Lot 11, Blk. 20, Alamo Land & Sugar Co. Subd., Alamo Tr. Perf. 650-56 ft.; bailing Wtr. S.O.

Quintana Petroleum Co. No. 1 John C. Engleman, Lot 10, Blk. 94, Las Mestanas grant. Cg. 8,576 ft.

Dayle Smith No. 1 Fairbanks & Young, Blk. 44, Porc. 46. Cg. 1,850 ft.

Jim Hogg County

French Oil Co. No. 2 Rodriguez, Sh. 3, Sur. 579, ElReyoto grant. Drlg. 1,835 ft.

Knode et al No. 1 Saunders, Sh. 3, Sur. 17, Las Animas grant. Loc.

S. L. Miller No. 2 Yeager, 777 ft. S line, 150 ft. E line, Blk. 6, Sur. 20, Drlg. 3,217 ft.

Jim Wells County

Gist & Graddy No. 1 Owens, 660 ft. N line, midway E and W lines, Sur. 151. Spudded.

G. M. Richardson No. 1 Garrett, 1,980 ft. S line, 1,640 ft. E line, sec. 5. T.D. 5,810 ft.; stdg.

Karnes County

DeGraffe & Reele No. 1 Cochran, 460 ft. E line, 160 ft. S line, McConnell League. Spudded in.

Kerr County

Auld & Evans No. 1 Heffner, 660 ft. N line, 330 ft. E line, sec. 13. U.R. 5,870 ft.

Eastland Oil Co. No. 7 Love, 660 ft. N Evans & Gant No. 1 Love, Martinez Sur No. 1,594. T.D. 2,432 ft.; show S.W.

LaSalle County

Davenport & Talbott No. 1 Watkins, 1,610 ft. S line, 330 ft. E line, Sur. 103. T.D. 2,700 ft.; S.D.

Paul Meader No. 1 Reed, sec. 136. Fsg. 2,790 ft.

Live Oak County

W. A. Brooks No. 1 Terrill, 1,000 ft. NE R.R., 1,500 ft. S line lse., Juan Houligan Sur. T.D. 1,080 ft.; S.D.

Dirks Bros. et al No. 1 Agnes Troell, 330 ft. SE and SW lines, 418-ac. tr., Thos. Pen Sur. Cg. 3,647 ft.

R. H. Feltner No. 1 J. T. Carter, 1,847 ft. NW line, 350 ft. NE line, 120-ac. tract sec. 319. T.D. 3,466 ft.; whipstocking 2,985 ft.

Inter-Allied Pet. Co. No. 1 Aetna Life Ins. Co., 660 ft. NW and SW lines, Pointevent Sur. 3, Abst. 336. Drk.

Windsor Oil Co. No. 1 B. E. Stolte, cen. tr., Wm. Kundy 3,690-ac. blk. Drk.

McMullen County

John F. Camp, No. 3 Byrne, 100-ac. tr., B. Odem Sur. T.D. 490 ft.; S.D.

Climax Oil Co. No. 1 Lark, 150 ft. S and W lines, Blk. 36, Scrugham Sur. Loc.

R. J. Hill No. 1 Richardson, Sur. 158. Set sur. csg.; drlg. 1,410 ft.

Magnolia Pet. Co. No. 2 Kincaid, 330 ft. S and E lines, Sur. 86. Sd. 1,810-22 ft.; tested gas; P.B. 1,322 ft.; comp. 20,000,000 ft. gas.

Rainer Oil Co. No. 1 Hagist, 330 ft. S and W lines, SW¼, SE¼, Sur. 25. M.I.M.

Reliance Oil & Roy. Co. and Santa Clara Oil Co. No. 1 Shiner, 330 ft. N line, 150 ft. E line, NW¼, W½, sec. 80, Shumway Subd. Drk.

V. G. Schimmell No. 3 Two Rivers ranch, 330 ft. S and W lines, Sur. 58. T.D. 1,146 ft.; D.&A.

Swearingen & White No. 1 Lark Est., 152 ft. W line, 165 ft. S line tr., Scrugham Sur. Loc.

Nueces County

M. F. Hurlburt No. 1 Phillips, sec. 8, Flour Bluff Garden Tracts. Drlg. 4,279 ft.

O. W. Killam No. 1 Ellick, 330 ft. N and E lines tr., sec. 109, Paul Subd. Set csg. 3,822 ft.; drlg. plugs.

Terminal Oil Prod. Co. No. 1 Thurman, 660 ft. N and W lines, SW¼, sec. 10. M.I. rig.

G. M. Richardson No. 1 Gerhardt, 660 ft. E line, 330 ft. N line, sec. 79. Drk.

Southern Minerals Corp. No. 2 Rand Morgan, 330 ft. N line, midway E and W lines, Lot 42, Roberts Subd., A.B.&M. Sur. 411. Drk.

San Patricio County

Benedum & Trees Oil Co. No. 1 Jones, 1,650 ft. E line, 990 ft. S line, NW¼ sec. 65. Drlg. 5,927 ft.

Benedum & Trees Oil Co. No. 2 Welder, sec. 19. T.D. 6,116 ft.; set whipstock 5,815 ft.

C. B. Bunte No. 1 Mayfield, 121 ft. W line, 237 ft. N line, Tr. 11, Ross Subd. M.I.M.

Joe Lundins No. 1 Welder, 330 ft. N and W lines, sec. 30, Paul Subd. Spudded.

Potrero Oil Co. No. 1 Welder, 2,000 ft. N and W lines, sec. 37. Cg. 5,737 ft.

Willis Storm No. 1 Nancy Hobbs, 622 ft. NW and SW lines, 30-ac. tr. T.D. 7,004 ft.; stdg.

Starr County

J. F. Anderson No. 1 Yzagierre, Tr. 1, Porc. 79, J. of Camargo. T.D. 390 ft.; S.D.

Coreta Oil Co. No. 1 Pena, 150 ft. S and E lines, Sh. 80, Porc. 81. T.D. 1,500 ft.; S.D.

O. W. Killam No. 1 Sanford Ricaby, 330 ft. W line, Porc. 83, J. of Camargo, 300 ft. S of Highway 4. Drlg. 1,127 ft.

Larkin & Warr No. 1 Kelsey-Bass, 533 ft. N line, 408 ft. E line, Lot 8, Porc. 87. R.U.

Ed Leach No. 1 Wood Est., 300 ft. W line E 5/7, Porc. 84. T.D. 2,500 ft.; S.D.

Porter Evans et al No. 1 Starr County Cattle Co., cen. Lot 14, Sh. 60, Porc. 89, J. of Camargo. Loc.

Willacy County

M. E. Morton et al No. 1 Santa Rosa, 330 ft. N and E lines, Lot 12, Blk. 31, Santa Rosa Subd., Sh. 44. Loc.

Shell Pet. Corp. No. 1 Yturria Land & Cattle Co., 990 ft. S and E lines, Share 64, San Juan de Carricitos grant. Cg. sh. 4,302 ft.

Wilson County

A. G. Reimenschneider No. 2 L. Harrell, 750 ft. NE line, 2,800 ft. NW line, Barrera Sur. Drlg. 662 ft.

Zapata County

Oklahoma Co. No. 1 Sanchez, Sh. 9, Blk. 37, Sanchez ranch. Set sur. csg.; drlg. 2,471 ft.

Q. J. Perren No. 1 Uribe, 330 ft. NE line, 227 ft. SE line, Blk. 31, Borrego grant. R.U.

Zavalla County

Bay Oil Co. No. 1 Calliant, sec. 43, A. B.&M. Sur. Drlg. 3,947 ft.

W. L. Bridges No. 1 Price & Flowers, 1,220 ft. N and W lines, Blk. 1, sec. 19. Drlg. 407 ft.

Frank Buttram No. 1 Whitecotton, 2,400 ft. N line, 300 ft. W line, A.B.&M. Sur. Drlg. 4,215 ft.

Leona Oil Co. and Witherspoon Oil Co. No. 1 West, 330 ft. E line, midway N and S lines, sec. 1, Bustillo Sur. T.D. 4,380 ft.; stdg.

S. W. TEXAS PROVEN

Dirks—Bee County

Dirks Bros. and McMurray No. 2-B Harris, 200 ft. N line, 990 ft. W line, 61.9-ac. tr., J. L. Dugat Sur. Drlg. 3,170 ft.

Illinois Pet. Co. No. 1 C. E. Hahl, 990 ft. NW and NE lines, 350-ac. tr., H. W. Fontaine Sur. Cg. sh. 3,735 ft.

Illinois Pet. Co. No. 12-B Hall, Butler Sur. M.I.M.

Sun Oil Co. No. 7 Page, 990 ft. SE and SW lines tr., Young Sur. Drlg. 3,583 ft.

Texas Co. No. 16 Young, 1,980 ft. NE of No. 9, T. J. Butler Sur. Top Pettus 3,915 ft.; T.D. 3,941 ft.; comp.

Pettus—Bee County

United Prod. Co. No. 52 Ray, Thos. Hanson Sur., Abst. 172. Sd. 3,934-35 ft.; deepening.

Ray—Bee County

N. V. Duncan No. 3-A Campbell, B.&B. Sur., Abst. 139. R.U.

Alta Verde—Brooks County

Nordan, Morris & Nash No. 1 Singer, 495 ft. E line, 835 ft. S line, Sur. 312. Drlg. 622 ft.

Pedernal Oil Co. No. 1 Singer, 330 ft. S line, 280 ft. W line, NW¼, SW¼, Sur. 426. No report.

Salt Flat—Caldwell County

Chiquita Oil Co. No. 1 Hickman, G. Hinds Sur. Drlg. 2,273 ft.

Driscoll—Duval County

Continental Oil Co. No. 9-A Sevier, Sur. 23. Spudded.

Government Wells—Duval County

J. T. Stover No. 1 Hester, 330 ft. S and E lines, SW¼, NE¼, Sur. 47. Drlg. 824 ft.

Hagist—Duval County

Marzo Oil Co. No. 3 Hagist, 660 ft. SW of No. 1, Sur. 6. Drlg. 1,815 ft.

Hoffman—Duval County

Duval Oil Corp. No. 1 Hoffman, 990 ft.

N line, 330 ft. NE line tr., Sur. 118. Drlg. 2,720 ft.

Duval Oil Corp. No. 3 Ruiz, 330 ft. S line, 990 ft. W line, sec. 110. Sd. 2,889-96 ft.; W.O.C.

W. D. Maston No. 1 Ruiz, Sur. 128. Set sur. csg.; stdg.

Plymouth Oil Co. No. 1-B Hoffman, 100-ac. tr., Sur. 118. Loma Novia sd. 2,-841-46 ft.; tstg.

Standard of Kansas No. 3 Hoffman, 80-ac. tr., Sur. 118. Drlg. 2,012 ft.

Sun Oil Co. No. 1 Sutherland, Sur. 62 Rmg. for D.S.T. 2,750 ft.

Labbe—Duval County

Stanolind O. & G. Co. No. 4 Farmers Life Ins., Sur. 416. Set sur. csg. 50 ft.; W. O.C.

Loma Novia—Duval County

Bridwell Oil Co. No. 3-A Hubbard, sec. 71. Skidding on.

Bridwell Oil Co. No. 6-B Hubbard, Sur. 75. T.D. 2,640 ft.; comp.

Bridwell Oil Co. No. 8-B Hubbard, Sur. 75. Drlg. 2,045 ft.

Bridwell Oil Co. No. 9-C Hubbard, Sur. 75. Skidding on.

Duval Oil Corp. No. 14-B Moody, Sur. 60. Drlg. 520 ft.

Duval Oil Corp. No. 23 B.C.C., Sur. 59. Comp.; 10 B.P.H.; T.D. 2,541 ft.

Highland Oil Co. No. 10 Hubbard, W 320-ac. tr., sec. 72. T.D. 3,761 ft.; comp. 32 B.P.H.

Highland Oil Co. No. 11 M. C. Hubbard, sec. 72. Drlg. 2,215 ft.

Humble O. & R. Co. No. 12-A Hubbard, Sur. 84. T.D. 3,833 ft.; comp. 9.64 B.P. H. on ½-in. choke.

Humble O. & R. Co. No. 35-B Hubbard, Sur. 72. R.U.; W.O. fuel.

Humble O. & R. Co. No. 45-B Hubbard, Sur. 72. Drlg. plugs. 2,739 ft.

Humble O. & R. Co. No. 60-B Hubbard, Sur. 72. Sd. 2,745-62 ft.; drlg. plugs.

Humble O. & R. Co. No. 61-B Hubbard. W½, Sur. 83. T.D. 2,780 ft.; comp. 16.5 B.P.H. on pump.

Humble O. & R. Co. No. 11 Ruiz, Sur. 553. Rng. tbg. 2,781 ft.; swbg.

Kaffie Lbr. Co. No. 1 Davidson, NW¼, Sur. 114. Tstg. 2,564 ft.

Magnolia Pet. Co. No. 32 Hahl, sec. 67. Comp.; 32 B.P.H. on ½-in. choke; T.D. 2,634 ft.

Magnolia Pet. Co. No. 33 Hahl, Sur. 67. Rng. csg. 2,604 ft.

Magnolia Pet. Co. No. 34 Hahl, Sur. 67. Drlg. 1,810 ft.

Magnolia Pet. Co. No. 2 Harvill, Sur. 64. Drk.

Reynosa Oil Co. No. 3-A Davidson, NE¼, Sur. 114. Drlg. 2,060 ft.

Rodney DeLange No 4 DuVon, Sur. 76. R.U.

Rosan Oil Co. and Texia No. 11 Hubbard, Sur. 84. Comp.; 30 B.P.H.; T.D. 2,814 ft.

Rosan Texia Oil Co. No. 14 Hubbard, Sur. 84. R.U.

Shell Pet. Corp. No. 1 Bishop, Sur. 59. S.D. for wtr. 1,523 ft.

Shell Pet. Corp. No. 32 Hubbard, Sur. 77. Comp.; 56.22 B.P.H. on ¼-in. choke; T.D. 2,729 ft.

Shell Pet. Corp. No. 7 Mendoza, Sur. 68. Comp.; 21.54 B.P.H.; T.D. 2,752 ft.

Sun Oil Co. No. 4 Hubbard, 99 ft. N line, 330 ft. W line, 336-ac. tr., sec. 83. Loc.

Texas Co. No. 13 B.C.C., Sur. 59. Sd. 2,-426-27 ft.; comp. 10 B.P.H.

Texas Co. No. 36 Wendt, Sur. 68. Sd. 2,-780-88 ft.; set csg.; W.O.C.

Texas Co. No. 37 Wendt, Sur. 68. T.D. 2,-682 ft.; comp. 30 B.P.H.

Texas Co. No. 38 Wendt, Sur. 68. Drlg. 2,590 ft.

Texas Co. No. 14 B.C.C., Sur. 59. Drlg. 1,620 ft.

Valley Osage Oil Co. No. 4 Hubbard, Sur. 75. Sd. 2,611-16 ft.; comp. 10 B.P.H.; T.D. 2,620 ft.

Valley Osage Oil Co. No. 5 Hubbard, Sur. 75. Drlg. plugs 2,602 ft.

Loma Vista—Duval County

Atlantic Oil Prod. Co. No. 1 J. F. Welder hrs., 330 ft. N and E lines, 160-ac. tr., Sur. 103. Loc.

Shell Pet. Corp. No. 1-A Welder, 330 ft. N line, 900 ft. W line lse., Sur. 103. P.B. 2,277-2,077 ft.; W.O.C.

Piedra Lumbre—Duval County

Humble O. & R. Co. No. 2-B D.C.R.C., N½ NE¼, Sur. 95. Cg. sh. 1,945 ft.

Magnolia Pet. Co. No. 3 D.C.R.C., Sur. 95. Sd. 1,969-79 ft.; gas blew out; plugged and abd.

Magnolia Pet. Co. No. 4 D.C.R.C., NW¼, Sur. 95. Drk.

Texas Co. No. 17 D.C.R.C., SW¼, Sur. 100. Drlg. 1,317 ft.

Seven Sisters—Duval County

Atlantic Oil Prod. Co. No. 6-D Welder, Sur. 113. M.I.M.

Atlantic Oil Prod. Co. No. 9-D Welder. 2,970 ft. E line, 330 ft. N line. Sur. 113. Sd. 2,462-77 ft.; comp.; no gauge.

Atlantic Oil Prod. Co. No. 10-D Welder, Sur. 113. Set csg. 2,206 ft.; sd. 2,192-2,205 ft.; drlg. in.

Atlantic Oil Prod. Co. No. 11-D Welder, Sur. 113. Drlg. 2,012 ft.

Buchanan & Blanco Oil Co. No. 2-B Welder. 990 ft. W line, 330 ft. N line. SW¼ NW¼, Sur. 591. Set csg. on sd.; W.O.C.

S. B. Cloyes No. 1 Serna, 330 ft. N and E lines tr., Sur. 384. Loc.

Dulce Oil Co. No. 2-B Serna, Sur. 384. Cg. 2,154 ft.

Humble O. & R. Co. No. 10 Smith, Sur. 384. P.B. 2,440 ft.; W.O.C.

Humble O. & R. Co. No. 12-A Serna, SW¼, Sur. 384. Sd. 2,471-78 ft.; comp. 20 B.P.H. on ⅛-in. choke.

Humble O. & R. Co. No. 16-A Serna, Sur. 384. Drlg. 1,950 ft.

Humble O. & R. Co. No. 8-B Serna, Sur. 384. T.D. 2,484 ft.; rng. tbg.

Humble O. & R. Co. No. 3 Wright, 330 ft. S and W lines, SW¼, Sur. 118. T.D. 2,-528 ft.; oil sd.; comp.; no gauge.

Humble O. & R. Co. No. 4 Wright, Sur. 118. Fsg. 2,145 ft.

Navarro Oil Co. No. 2 Welder, Sur. 383. Sd. 2,445-47 ft.; W.O.C.

Parr Oil Co. No. 3 Welder, Sur. 383. Rng. csg. 2,456 ft.

Reliance & Kleiner No. 6 Welder, Sur. 381. Set csg. 2,397 ft.; W.O.C.

Reliance Oil & Roy. Co. and Henderson & Harvey No. 1 Drummond, 330 ft. S and E lines, Sur. 308. Fsg. 2,000 ft.

Reliance Oil & Royalty Co. No. 2-A Telford, Sur. 386. Sd. 2,671-92 ft.; S.W.

Santa Clara Oil Co. (Atkins & O'Neil) No. 32 Welder, Sur. 383. Sd. 2,454 ft.; comp. 26.8 B.P.H. on ⅝-in. choke.

Santa Clara Oil Co. No. 2-B Welder, Sur. 383. Drlg. 1,625 ft.

Santa Clara Oil Co. (Atkins & O'Neil) No. 7-B Welder, Sur. 383. Sd. 2,458-74 ft.; comp.; 24.12 B.P.H. on ⅝-in. choke.

Santa Clara Oil Co. No. 10-D Welder, Sur. 383. Drlg. 1,150 ft.

Shell Pet. Corp. No. 7-A Welder, Sur. 385. Set csg. 2,460 ft.; W.O.C.

Westheimer & Daube No. 9 Campos, Sur. 224. Sd. 2,199-2,218 ft.; completing.

Pearsall—Frio County

Amerada Pet. Corp. No. 1 Correy & McWilliams, 660 ft. N line, 721 ft. W line, Tr. 17, Manuel Tijerina Sur. No. 300. T.D. 5,676 ft.; acidized; testing little oil.

Amerada Pet. Corp. No. 7 Halff & Oppenheimer, 1,320 ft. W line, 330 ft. S line, J. H. Gibson Sur. No. 16. T.D. 3,926 ft.; P.B. 3,910 ft.; W.O. tools.

Amerada Pet. Corp. No. 2 Smith, 466 ft. E line, 2,771 ft. N line tr., J. V. Mason Sur. Drlg. 3,815 ft.

Combs & Oakes No. 1 Arp, 330 ft. S and E lines, 162-ac. tr., S. Blair Sur. 297. Drlg. 1,420 ft.

Gillette—Goliad County

Jane Oil Co. No. 1-C Gillette, J. Gomez Sur. Sd. 3,660-68 ft.; comp. 80 B.P.D.

North Petlus—Goliad County

Henshaw Bros. No. 1 Weldon & Lackey, 200 ft. NE and NW lines lse., J. Gomez Sur. T.D. 3,692 ft.; comp.; gasser.

Jane Oil Co. No. 2 Lackey & Welder, 660 ft. SE of No. 1, J. Gomez Sur. Drlg. 2,967 ft.

Jane Oil Co. No. 6 Mudd, B.&B. Sur. 25. Comp.; no gauge; T.D. 3,722 ft.

Jane Oil Co. No. 9 Mudd, B.&B. Sur. 25. T.D. sd. 3,701 ft.; set csg.; W.O.C.

Magnolia Pet. Co. No. 1 Weldon, J. Gomez Sur. Drlg. 2,932 ft.

Sun Oil Co. No. 6 Scarborough, E. Talley Sur. R.U.

Clark—Guadalupe County

Eickenroht & Gallagher No. 1 Johns, 180 ft. E line, 450 ft. N line, 840-ac. tr., DeWitt Sur. 13. Drlg. 2,888 ft.

Mercedes—Hidalgo County

Union Sulphur Co. No. 7 American Rio Grande L. & I. Co., 4,000 ft. SE of No. 1, Farm, Tr. 2,309, Blk. 59. Jetting 7,446-49 ft. with gas.

Union Sulphur Co. No. 8 American Rio Grande L. & I. Co., 660 ft. N & F lines, Tr. 2,120, Blk. 57. Cg. sh. 7,756 ft.

Union Sulphur Co. No. 9 American Rio Grande L. & I. Co., Farm Tr. 2,275, Blk. 59. Cg. sh. 6,414 ft.

Samfordyce—Hidalgo County

J. H. Anderson No. 5 Guerra, Tr. 254, Porc. 40. Drlg. 1,105 ft.

Swan Bros. No. 1 Lula George, 150 ft. S line, 230 ft. W line. 10-ac. tract. Tract 13, Porc. 40. Sd. 2,748-52 ft.; T.D. 2,754 ft.; C.O.

Weekly Oil Corp. No. 1 George, Tr. 13, Porc. 41. Drlg. 1,215 ft.

Bentonville—Jim Wells County

Stanolind O. & G. Co. No. 1 Raney, 330 ft. N and E lines, sec. 16. M.I.M.

Stanolind O. & G. Co. No. 1 Sain, 330 ft. S and W lines, sec. 18. M.I.M.

Texon and Lucey No. 1 Dodd, 330 ft. S and E lines, sec. 15, R. King Farm Lots Subd. Set sur. csg. 600 ft.; W.O.C.

Sandia—Jim Wells County

J. E. Walsh No. 2 Wade, Lot 2, Blk. "C," Bode Subd. T.D. 1,500 ft.; S.D. for fuel.

San Diego—Jim Wells County

Houston Oil Co. No. 1 Hawkins & Wallace, 990 ft. S and E lines, Blk. 11. Set csg. 2,955 ft.; W.O.C.

Lucas—Live Oak County

Houston Oil Co. No. 34 Cartwright, 1,-033 ft. N of No. 33. T.D. 500 ft.; blew out; stdg.

Loma Alta—McMullen County

V. G. Schimmel No. 1 Hagist, 330 ft. N and E lines, SW¼, Sur. 108. Drlg. 1,-012 ft.

King—Nueces County

La Jita Oil Corp. No. 2 King, 660 ft. N and W lines, sec. 24. Cg. 5,587 ft.

Saxet Heights—Nueces County

Bartlett & Reed No. 1 Carson, SW cor., 20-ac. tr., Villareal Sur. Set csg. 4,126 ft.; perf. 4,078-84 ft.; C.O.

Capitol Oils, Inc., No. 1 L. Ayres, cen. 5-ac. tr., Villareal Sur. Sd. 4,069-80 ft.; flowing in pits; no gauge.

Cherokee Oil Co. No. 1 Cowles-Jenkins, Villareal Sur. Perf. 4,075-79 ft.; comp. 4 B.P.H. on 7/64-in. choke.

Cherokee Oil Co. No. 1 Holder, 5-ac. tr., Villareal Sur. R.U.

Cherokee Oil Co. No. 1 Werner, Villareal Sur. Perf. 4,075-79 ft.; comp. 80 B.P.D.; 5/64-in. choke; T.D. 4,081 ft.

J. K. Culton No. 5 Baldwin, Blk. 20, Russell Farm Lots. Sd. 4,076-96 ft.; comp.; est. 15 B.P.H. on ¼-in. choke.

J. K. Culton No. 6 Baldwin, Blk. 20, J. C. Russell Farm tr. Skidding on.

J. K. Culton No. 6 Whelan, 82.38-ac. tr., Villareal Sur. Drlg. plugs; T.D. 4,105 ft.

Tom Graham No. 1 City of Corpus Christi, C 5-ac. tr., Villareal Sur. Drld. plugs 4,045 ft.; rng. screen.

Tom Graham No. 1 Kaiser, Villareal Sur. T.D. 4,077 ft.; rng. tbg.

Graham & Roberts No. 1 Curry, Villareal Sur. Sd. 4,080-85 ft.; brought in as gasser; reworking.

D. H. Hawn No. 1 Prior, 5-ac. tr., Oak Park Addn. Drlg. 1,420 ft.

Johnson et al No. 1 Cowles, 160 ft. W line, 75 ft. S line tr. T.D. 3,500 ft.; fsg.

Johnston et al No. 1 Werner, Blks. 11, 12, Ellendale Gardens No. 1. Set csg. 4,-081 ft.; W.O.C.

Port O. & G. Co. No. 1 Country Club, C Lot 20, Villareal Sur. Cg. 4,074 ft.

Republic Nat. Gas Co. No. 4-B Baldwin, 790 ft. SE of No. 2, 330 ft. NE line, Blk. 19. Tstng. 4,100 ft.

W. A. Richardson No. 2 Edwards, 10-ac. tr., Villareal Sur. Drk.

Richardson Pet. Co. No. 1 Poth, C 4-ac. tr., Villareal Sur. Top sd. 4,026 ft.; comp.; no gauge.

Hiram Reed No. 1 Quinn, Villareal Sur. T.D. 4,117 ft.; S.O.

J. B. Salmon No. 1 Clark, Blk. 4, Oaklawn Subd. Drlg. plugs 4,076 ft.

W. F. Stone No. 1-B Schliecher, Blk. 13, Ellendale Gardens No. 2. Perf. 4,079-85 ft.; comp.; no gauge.

Taylor Ref. Co. No. 4 Corpus Christi Golf and Country Club, 82-ac. tr., Villareal Sur. Set csg. 4,080 ft.; W.O.C.

Taylor Ref. Co. No. 3 Saunders, Villareal Sur. Comp.; no gauge; T.D. 4,081 ft.

Westgate Oil Co. No. 6 Sturm Est., Villareal Sur. Sd. 4,078-82 ft.; comp. 5 B.P. H. on 7/64-in. choke.

Saxet—Nueces County

Conroe Drlg. Co. No. 1 Frank Bliss, W 80-ac. tr., J. W. Stevens Sur. No. 406. Cg. 4,320 ft.

Tom Graham No. 2 Flato, Blk. 30, P.B. 4,342 ft.; cmtd. perforations 4,322-32 ft.; T.D. 4,357 ft.; prep. abd.

Great States Oil Co. No. 1 Smith, 330 ft. W line, 125 ft. N line, 11-ac. tr. Spdd.

W. B. Hinton No. 1 E. B. Cole, 60-ac. tr., Villareal Sur. Rmg. 4,110 ft.

A. F. Holliday No. 2 Griffith, 347 ft. W of No. 1, G. Frank Sur. 416. Drlg. 1,-307 ft.

A. F. Holliday No. 3 Hutchins, sec. 30. Drlg. 3,920 ft.

Houston Oil Co. No. 3 Harrell, Blk. 19, Sheppard Farm Lots. Drlg. 2,920 ft.

Houston Oil Co. No. 11 Rand Morgan, sec. 7, Rge. 5. Set sur. csg. 184 ft.; W. O.C.

Morgan Gulf Oil Co. and Great States Oil Co. No. 1 Humphreys, 330 ft. S line, 990 ft. W line, Stevens Sur. 406. Set csg. 508 ft.; W.O.C.

Morgan Gulf Oil Co. and Great States No. 1-B Rand Morgan, B.S.&F. Sur. 404. Drlg. 1,020 ft.

Morgan Gulf Oil Co. No. 2 Rand Morgan, 990 ft. N and E lines, Sur. 403. Sd. 5,-836-44 ft.; comp. est. 12 B.P.H. on 3/16-in. choke.

Renwar Oil Co. No. 1 Morgan, sec. 315. Drlg. 4,357 ft.

W. A. Richardson No. 1 Smith, C Blk. 4, Clarkewood townsite. Spudded in.

W. A. Richardson No. 3 Meredith, Lot 11, Clarkwood townsite. Set csg. 4,403 ft.; drlg. plugs.

Richardson et al No. 3 Sedwick, Sur. 586. Sd. 4,543-57 ft.; set csg. 4,549 ft.; W.O.C.

Southern Minerals Corp. No. 2 Rand Morgan, Blk. 42, Roberts Subd. M.I. rig.

Southern Minerals Corp. No. 4 Bliss, Sur. 406. Drlg. 175 ft.

Southern Minerals Corp. No. 1 Isensee, C. Land Sur. 404. Spdg. in.

Southern Minerals Corp. No. 3 Isensee, C. Land Sur. 404 ft. T.D. 4,402 ft.; comp. 818 B.P.D.

Southern Minerals Corp. No. 4 Isensee, SE cor. 235-ac. tr., C. Land Sur. 404. Sd. 4,387-4,404 ft.; rng. tbg.

Southern Minerals Corp. No. 1 Mastin, G. Frank Sur. 416. Sd. 5,803-21 ft.; D.S.T. 10 min. 2,000 ft. P.L.O.; set csg. 5,824 ft.; W.O.C.

Southern Minerals Corp. No. 4 Smith, Blk. 14. Set csg. 4,852 ft.; comp.; no gauge.

Southern Minerals Corp. No. 5 Smith, Blk. 4, H. B. Sheppard Farm Lots. Set sur. csg. 156 ft.; W.O.C.

Texon Royalty Co. No. 1 Lingnau, 13.44-ac. tr., C. Land Sur. 404. Sd. 4,432-39 ft.; blew out; killed and abd.

Texon Royalty Co. No. 1 McElroy, 115 ft. N line, 105 ft. W line, 40-ac. tr., Gallagher Sur. D.S. stuck 4,100 ft.; stdg.

Plymouth—San Patricio County

Humble O. & R. Co. No. 1 Bevly, 486 ft. N and W lines tr., Blk. 8, sec. 35, Taft Sub. Perf. 5,035-49 ft.; rng. screen.

Magnolia Pet. Co. No. 7 Corpus Christi Bank, 922 ft. E of No. 6, sec. 34. Drlg. 5,692 ft.

Plymouth Oil Co. No. 43-C Welder, 2,046 ft. S line, 2,355 ft. W line, sec. 49. Brought in as gasser; reworking: T.D. 5,650 ft.

Plymouth Oil Co. No. 44-C Welder, 5,256 ft. S line, 1,312 ft. E line, sec. 71. T.D. 5,649 ft.; comp. in pits; no gauge.

Plymouth Oil Co. No. 45-C Welder, 1,128 ft. S line, 2,522 ft. W line, sec. 49. T.D. 5,640 ft.; stdg.

Plymouth Oil Co. No. 46-C Welder, 659 ft. S line, 1,567 ft. S line, sec. 49. Set csg. 5,645 ft.; W.O.C.

Plymouth Oil Co. No. 47-C Welder, 2,187 ft. S line, 1,433 ft. W line, sec. 49. R.U.; W.O. tools.

Sun Oil Co. No. 4 Hunt, 466 ft. S and W lines, 154.39-ac. tr. Comp.; 30 B.P.H. on 5/32-in. choke; T.D. 5,642 ft.

Sun Oil Co. No. 7 Hunt, 466 ft. S and E lines, Lot 5, sec. 34, Taft Farm Lands Subd. Drk.

Texon Roy. Co. No. 1 Rambo, 330 ft. W line, 466 ft. N line, Lot 6, sec. 35, T.D. 5,653 ft.; blew out and burned; killed; stdg.

Taft Field—San Patricio County

Humble O. & R. Co. No. 1 Godwin, 330 ft. S and W lines, sec. 23. Taft, Farm Lands, Third Addn. T.D. 5,352 ft.; comp. 123 B.P.D. on 9/14-in. choke; T.P. 400 lbs.

Humble O. & R. Co. No. 2 Mayo, 1,323 ft. S line, 1,152 ft. E line tr., Tabor Sur. Drlg. sh. 1,750 ft.

Shell Pet. Corp. No. 1 Pullin, Blk. 4, sec. 1. T.D. 4,915 ft.; fsg.

Margo—Starr County

H. L. Curry No. 1 Garcia, 20-ac. tr., Sh. 7-B, Porc. 70, J. of Mier. Drlg. 870 ft.

St. Marys O. & G. Co. No. 1 O'Shea, 450 ft. N line, 935 ft. W line, Sh. 65, Porc. 71. Drlg. 697 ft.

Samfordyce—Starr County

E. A. Graham No. 1 Santos Villareal, 26.48-ac. tr., Tr. 250, Porc. 38. T.D. 2,-878 ft.; S.D.

Phillips and Barnsdall No. 10 Yturria Land & Cattle Co., 110-ac. tr., E½, Porc. 100. Set sur. csg. 200 ft.; W.O.C.

Porter & Grimes No. 2 Garcia Land & Livestock Co., Lot 1, W½, Porc. 100. M.I.M.

Skelly Oil Co. No. 12 Seabury, 10-ac. tr., Tr. 256, Porc. 38. Drlg. 1,412 ft.

Sun Oil Co. No. 2 Chapatola, Porc. 99. Comp.; 660 B.P.D. on ¼-in. choke; T.D. 2,822 ft.

Aviator—Webb County

Five Spot Drlg. Co. No. 1 Brunl, Blk. 44, Albercas grant. Sd. 1,677-80 ft.; drlg. plugs.

Cole—Webb County

Cole Pet. Co. No. 97 Benavides, Blk. 8, sec. 7. T.D. 3,447 ft.; D.&A.

Lopez—Webb County

Hunter Oil Co. No. 1-A Billings, Sur. 113. Tested gas sd. 2,220 ft.; stdg.

C. H. Lewis No. 6 Lopez, sec. 110. M.I.M.

Mills Bennett Prod. Co. No. 6 Garcia, Sur. 113. Comp.; 16 B.P.H.; T.D. 2,192 ft.

Mills Bennett Prod. Co. No. 10-A Billings, Sur. 113. Comp.; 12 B.P.H.; T.D. 2,151 ft.

Mortimer & Springer No. 8 M. Lopez, sec. 114. M.I.M.

Superior Oil Co. No. 6-A Billings, Sur. 113. Sd. 2,207-25 ft.; comp.; no gauge.

Superior Oil Co. No. 8-A Billings, Sur. 113. Comp.; 18 B.P.H.; sd. 2,211-35 ft.

O'Hern—Webb County

Magnolia Pet. Co. No. 6 J. Benavides, Blk. 389. T.D. 2,886 ft.; comp.; 7 B.P.H. on 5/16-in. choke.

Magnolia Pet. Co. No. 12 Seacord-Benavides, Blk. 390. Comp.; 7 B.P.H. on 5/16-in. choke; T.D. 2,870 ft.

Magnolia Pet. Co. No. 13 Seacord-Benavides, Hale Subd., Arispe grant. Drlg. 2,450 ft.

Magnolia Pet. Co. No. 9-B Benavides, Hale Subd., Arispe grant. Drlg. 1,650 ft.

J. J. O'Hern No. 1 S. Benavides, Blk. 460. Drlg. 1,215 ft.

Otis Phillips No. 2 Benavides, Blk. 295. Comp.; 15 B.P.H.; T.D. 2,849 ft.

T. S. Reed No. 3 Brennan-Benavides, Blk. 317. Drlg. 2,010 ft.

Texia Oil Corp. No. 1 Benavides, Blk. 361. Sd. 2,853-87 ft.; comp.; 12 B.P.H.

Texia Oil Corp. No. 2-D Benavides, Hale Subd., Arispe grant. R.U.

Escobas—Zapata County

B. W. Roscoe No. 4 Bustamante, Share 33. Drlg. 1,247 ft.

S.R.C. Oil Co. No. 17-A Trevino, Sur. 66. Cg. 1,390 ft.

Texas Co. No. 88 Whitehead, Cerrito Blanco grant. Sd. 1,247-59 ft.; D.&A.

Texas Co. No. 89 Whitehead, Cerrito Blanco grant. Drlg. 774 ft.

Haynes—Zapata County

Clover O. & G. Co. No. 13 Haynes, Blk. 7. Drlg. 612 ft.

WEST TEXAS WILDCATS

Andrews County

Grisham-Hunter Oil Corp. No. 1 Ratliff & Bedford, sec. 24, Blk. 73, P.S.L. Sur. Machine.

Humble O. & R. Co. No. 1 J. M. Spinks, sec. 13, Blk. A-20, T.D. 4,550 ft.; on test.

Brewster County

F. C. Dodson No. 1 Texas American Synd., sec. 66, Blk. 10, G.H.&S.A. Sur. Drlg. 1,775 ft.

Cochran County

Cascade and Honolulu Oil Corp. No. 1 E. B. Duggan, cen. Labour 13, League 55, Oldham County School Land. Drlg. 250

Concho County

W. C. Nelson et al No. 1 Rice, sec. 13, H.&T.C. Sur. Drlg. 1,477 ft.

Crane County

Clark et al No. 1 A. P. Jordan, sec. 13 Blk. B-22, P.S.L. Sur. Machine.

Gulf Oil Corp. No. 2 W. N. Waddell, sec. 18, Blk. B-21. Drlg. 1,791 ft.

Gulf O. Corp. No. 3 Tubbs, 440 ft. N and E, sec. 12, Blk. 27-B, S.D. 620 ft.

Humble O. & R. Co. No. 2 Tubbs, sec. 11, Blk. B-27. Drlg. 3,339 ft.

Loffland Bros. No. 2 Tubbs, sec. 9, B-27. Drlg.

Moore Bros. No. 1 Barnsley, sec. 43, Blk. 32, P.S.L. Sur. Drlg. 3,335 ft.

Rider et al No. 1 Thaxton, 200 ft. from NE and 2,570 ft. from SE, sec. 2, W. L. Wilkenson Sur. Spudded and S.D.

Sinclair Prairie Oil Co. et al No. 1 Tubbs, sec. 3, Blk. B-27. Drlg. 4,175 ft.

L. R. Stroud No. 1 Moseley. Drlg. 1,735 ft.

Crockett County

John I. Moore No. 1 A. C. Hoover, sec. 4 Blk. FF, B.&B. Sur. T.D. 735 ft.; lowering csg.

Ector County

W. Dunning, Jr., No. 1 H. E. Cummins, sec. 32, Blk. 45, Twp. 1n, T.&P. Sur. S.D. 3,975 ft.; flowing 20 B.P.H.

Grisham-Hunter Corp. No. 1 R. B. Cowden, C of SE¼, sec. 10, Blk. 45, Twp. 2n, T.&P. Sur. Cellar.

Edwards County

Paul Texas No. 1 J. B. Stewart, sec. 2, Blk. DA, G.C.&S.F. Sur. S.D. 5,290 ft.

Fisher County

Forest Dev. Co. No. 1 A. M. Dry, sec. 103, Blk. 2, H.&T.C. Sur. Drlg. 2,663 ft.

Gaines County

Landreth Prod. Co. No. 1 Kirk, sec. 22, A-21. Drlg. 2,952 ft.

Garza County

Brown Eagle Oil Co. No. 1 Sullivan, 1,-290 ft. from N and 257 ft. from W, Blk. 5, K. Aycock Sur. Loc.

Glasscock County

Fleetborn Oil Corp. No. 1 F. C. Dodson, sec. 13, Blk. 34, Twp. 3s. S.D. 2,149 ft.

Bruce Frazier No. 1 E. Patterson, 330 ft. N and E, sec. 184, Blk. 29, W. & N.W. Drlg. 222 ft.

M. B. Stanton et al No. 1 W. P. Edwards, sec. 11, Blk. 34, Twp. 3s, T.&R. Sur. Drlg. 580 ft.

Howard County

Southern Oil Co. No. 1 W.P. Edwards, sec. 32, Blk. 30, Twp. 1s, T.&P. Sur. Drlg. 2,463 ft.

D. C. Reed et al No. 1 Walter Pike, sec. 24, Blk. 33, Twp. 1n, T.&P. Sur. Drlg. 1,030 ft.

Hudspeth County

Haymon Krupp Oil & Land Co. No. 1 Thaxton, sec. 34, Blk. 74, Twp. 4, T.&P Sur. T.D. 893 ft.; drlg. 650 ft. in new hole.

Jeff Davis County

C. M. Joiner No. 1 Jones & Coffield, sec. 8, Blk. 3, H.&T.C. Sur. Drlg. 2,725 ft.

Jones County

Gyr & Davis No. 1 Clyburn, E. H. Millard Sur., Sub. 27. R.U.

T. D. Humphrey No. 1 J. M. Radford, 1,-sec. 19, Blk. 16, T.&P. Sur. Drlg. 2,210 ft.

Parker No. 1 C. L. Brown, sec. 9, Blk. 2, T.&N.O. Sur. Drlg. 1,816 ft.

Menard County

Wilcox O. & G. Co. No. 1 Merchenson, sec. 158, E.L.R.R. Sur., Abst. 1,840, 8 miles S of Menard. Drlg. 2,420 ft.

Pecos County

Dobbs Oil Co. No. 1 Rooney, sec. 12, Blk. 125, T.&St.L. Sur. Drlg. 1,327 ft.

S. Thompson No. 1 Elsinore Cattle Co., sec. 54, Blk. D, G.C.&S.F. Sur. T.D. 2,-422 ft.; P.B. to 2,329 ft.; shot with 300 qts. 2,225-2,300 ft.; C.O.

Trans-Pecos Oil Co. No. 1 F. W. Popham, sec. 235, Blk. 11, G.H.&S.F. Sur. S.D. 546 ft.

Presidio County

Linderman Bros. Oil Corp. No. 1 J. R. Biedeco & Badgley, sec. 15, Blk. 251, G.C.&S.F. R.R. Co. Sur., 2¼ mil. NE of Presidio. T.D. 1,635 ft.; trying to loosen pipe.

Reagan County

Bahan & Rhodes No. 1 M. Chase, sec. 40, Blk. 36, Twp. 5s, T.&P. Sur. Drlg. 1,-215 ft.

Schleicher County

Cardinal Oil Co. et al No. 1 J. A. Whitten, sec. 35, Blk. LL, T.C.R.R. Sur. Drlg. 4,135 ft.

Magnus Oil Co. No. 1 Judkins & Spencer, C SW¼ sec. 4, Blk. V-25. Elev. 2,289 ft.; S.G. 4,350 ft.; gas sd. 4,956-58 ft.; fsg. 5,410 ft.

Scurry County

Bristow & Cantrill No. 1 Shannon, Est., sec. 331, Blk. 97, H.&T.C. Sur. Drlg. 3,675 ft.

Terry County

J. A. Estes No. 1 F. B. Graham, 1,650 ft. from S and 990 ft. from W, sec. 23, Blk. T, O.&W.R.R. Loc.

Tom Green County

Spinner No. 1 Reed, Sub. 39, Mason & Perry Sur. S.D. 2,925 ft.

Ward County

Gulf Oil Corp. No. 1 W. A. Estes, sec. 35, Blk. 34, H.&T.C. Sur. T.D. 775 ft.; ran csg.

P. Moran et al No. 1 Reynolds, 330 ft. from NE and NW, sec. 12, Blk. 5, H. &T.C. Loc.

Peck et al No. 2 Reynolds, 330 ft. from SE and NE sec. 12, Blk. 32, H.&T.C. Sur. R.U. spudder.

Richardson Oils, Inc., No. 1 Hathaway, sec. 37, Blk. 34, H.&T.C. Sur. T.D. 2,-275 ft.; gas 2,265 ft.; stuck tools.

Superior Oil Co. No. 1 J. H. Hughes, sec. 67, Blk. 34, H.&T.C. Sur. Drlg. 2,238 ft.

Winkler County

Bert Fields et al No. 1 Pure-Clapp, 330 ft. N and E, sec. 26, Blk. 26. Drlg. 2,936 ft.; making 10 B.P.H.

Illinois Oil Co. No. 1 McCutchen, sec. 16, Blk. B-3. Cellar.

R. H. Henderson et al No. 1 J. B. Walton, sec. 10, Blk. 26. T.D. 3,045 ft.; swbg. and C.O.

Herbert Oil Co. No. 1 I. Hendrick, 2,310 ft from S and W, sec. 14, Blk. 26. S.D. 3,550 ft.

Humble O. & R. Co. No. 2-C Walton, sec. 34, Blk. 74, P.S.L. Sur. Drlg. 1,732 ft.

Magnolia Pet. Co. No. 1 State-Walton, sec 7, Blk. B-3. T.D. 3,695 ft.; P.B. 3,171 ft.; to pump.

Fred Hyer No. 1 Evans, sec. 8, Blk. 56. S.D. 4,055 ft.

Joiner No. 1 Evans, sec. 46, Blk. 73, P.S.L. Sur. Drlg. 3,200 ft.

Read & Duffey No. 1 Sealey, 330 ft. from N and W, sec. 8, Blk. A, G.M.M.B.&A. Sur. Loc.

Superior O. & G. Co. of Tulsa No. 1 M. J Hill, sec. 18, Blk. B-11, P.S.L. Sur. S.D. 3,155 ft.

Wahlenmaier and Atlantic Oil Prod. Co No. 1-A Walton, sec. 34, Blk. 74. T.D. 3,000 ft.; to make D.S.T.

Yoakum County

Bahan et al No. 1 Henard, C SW ¼, sec. 367, Blk. D, J. H. Gibson Sur. S.D. 140 ft.

Stogner et al No. 1 Roosevelt, 2,230 ft. from N and 330 ft. from E, sec. 215, Blk. D, John H. Gibson Sur. T.D. 140 ft. R.U. rotary.

TEX. PANHANDLE WILDCATS

Gray County

Bell O. & G. Co. No. 2 Furneaux, sec. 102, Blk. B-2, H.&G.N. Sur. Drlg.

Joana Oil Corp. No. 1 Rendleman, sec. 146, Blk. B-2, H.&G.N. Sur. Drlg. 2,-528 ft.

K. Kinsey No. 1 Stephens, sec. 187, Blk. sec. 546, Blk. H, B-2, H.&G.N. Sur. T.D. 2,475 feet, fishing tools.

Hartley County

O. V. Beck et al No. 1-A Matador Ranch, sec. 20, Blk. 22, C.S.S. Sur. Pipe stuck 4,600 ft. and S.D.

Hutchinson County

Phillips Pet. Co. No. 1 Bryan, sec. 6, Blk M-21, T.C. Ry. Sur. T.D. 3,061 ft., pay 2,990-3,060 ft.; swbd. 150 bbls. in 10 hrs.

Harry Stekall No. 1 Erie Thompson, 330 ft. from N and E lines, E½ sec. 5, Blk. M-18, D.P. Sur. Drlg. 315 ft.

L. L. Travis et al No. 1 Hodges, sec. 14 Blk. X-62, H.O.&B. Sur. T.D. 3,062 ft.; putting on pump.

Moore County

Moran Bros. No. 1 Lucky Tiger Oil Co., 330 ft. from S and E lines, SE¼ sec. 5, Blk. 1, P.D. Sur. Spdg.

Shamrock O. & G. Co. No. 1 Ryan-Jones, sec. 190, Blk. 2-T, T.&N.O. Sur. Deepened to 3,495 ft. and P.B. to 3,461 ft.; tested 21 bbls. oil and wtr. in 24 hrs.

Wheeler County

Allender & Heare No. 1 Harvey, sec. 67, Blk. 13, H.&G.N. Sur. T.D. 2,187 ft.; fsg.

Ben G. Barnett No. 1 Stewart, sec. 73, Blk. 13, H.&G.N. Sur. S.D. 2,136 ft.

Johnston et al No. 1 Rabo, sec. 105, Blk. 23, H.&G.N. Sur. Spudded and S.D.

Phillips Pet. Co. No. 1 Porter, sec. 35, Blk. A-3, H.&G.N. Sur. T.D. 3,235 ft., wtr. broke in after cmtg. 10-in. csg.; now recmtg.

E. C. TEXAS WILDCATS

Anderson County

Gulf Oil Corp No. 1 Rose, 1,770 ft. from SW and 1,370 ft. from NW of Robt. Irwin Sur. T.D. 5,476 ft.; elev. 487 ft.; washing.

Angelina County

G. E. Ginter No. 1 Martin Wagon Works, 150 ft. from N and 200 ft. from E, E. Evans Sur., 2 mi. W of Homer. R.U.

Bill La Rue No. 1 Cameron Lbr. Co., 2,700 ft. from most E E line and 400 ft. from S line of I. Ray Sur. Weches 1,178-1,201 ft.; drlg. 1,375 ft.

Bowie County

Woodley Pet. Co. No. 1 Lumpkin, S.D. 3,260 ft.

Cherokee County

Humble O. & R. Co. No. 1 S. D. Goodson, 600 ft. from N and 700 ft. from W, L. Reynolds Sur., 4 mi. SW of Jacksonville. Top Pecan 3,590 ft.; elev. 428 ft.; drlg. 3,826 ft.

Falls County

E. L. Chapman et al No. 1 S. Grocholski, SE cor. of county. R.U.

Franklin County

Lucey Pet. Co. No. 19 W. Crawford, O. James Sur. Pecan 1,593-1,800 ft.; elev. 371 ft.; drlg. 3,420 ft.

Grayson County

Olson Drlg. Co. No. 1 Southwestern Life Ins. Co., J. C. Jamison Sur., 6 miles NW of Denison. Elev. 767 ft. Top Viola 4,-901 ft.; top Woodford 4,474 ft.; T.D 5,890 ft.; to P.B.

P. A. Shaver No. 1 Wm. Blair, 10 ft. from Cook County line, R. H. Deavers Sur., 1½ mi. SW of Tioga. S.D. 89 ft.

Henderson County

McDougal et al No. 1 E. Price, M. Mathews Sur., 4 mi. S of Trinidad. Drlg.

Kaufman County

Scott & Woodside No. 1 Robinson, A. Cherino Sur., 2 mi. W of Scurry. R.U.

Lamar County

J. Forrester et al No. 1 J. E. Woodward, L. Highton Sur., but in J. W. Wood-ward Sur., 1 mi. E of Mintel. Top Paluxy, 3,060 ft.; elev. 402 ft.; top anhydrite 3,735 ft.; S.D. 4,516 ft.

North Texas Synd. No. 1 Haynes & McCuistion, A. W. Wright Sur., 4 mi. NE of Garrett Bluff. Georgetown 275-738 ft.; top Paluxy 739 ft.; S.D. 1,930 ft.

Limestone County

E. H. Daugherty No. 1 S. Welch, A. Varella Sur., 4 mi. W of Groesbeck. T.D. 3,131 ft.; R.U. to deepen.

C. L. Lytle No. 1 J. L. Thompson, P. Varella Sur., Mexia field. S.D. 6,205 ft.; set pipe 6,150 ft.

Navarro County

E. A. Thomason No. 2 Estes Bros., Wm. Gilbert Sur., 1,000 ft. E of No. 1, 1 mi. E of Roane. Drlg.

Red River County

Abercrombie-Harrison No. 1 Temple Lbr. Co., D. D. Bruton Sur., 10 mi. NE of Clarksville. S.D. 100 ft.

Midwest and Texhomia Oil Co. No. 1 Hacker & Hughes, M.E.&P. Sur., 9 mi. NE of Talco. S.D. 200 ft.

Williams et al No. 1 L. and O. Roberts, James Bankston Sur., 2 miles NE of Annona. Elev. 396 ft.; S.D. 725 ft.

Rusk County

McCallum et al No. 1 E. C. Gary, John Piburn Sur., 5 miles S of Henderson. Elev. 338 ft.; S.D. 3,750 ft.

Pure Oil Co. No. 1 W. H. Faulkner, Wm. Elliott Sur., S of Concord. Elev. 562 ft.; top Georgetown 3,450 ft.; drlg. 4,658 ft.

Titus County

Jule Alford No. 2 Fry, 150 ft. E and 225 ft. N of 54-ac. tr., I. P. Stern Sur., 1,-313 ft. N of No. 1. Drlg.

Humble O. & R. Co. No. 1 M. B. Groves, Ben Jones Sur. Cut fault at 1,642 ft.; Top Woodbine 3,240 ft.; ran Schlumberger; no showing; S.D. 4,492 ft.; set 8⅝-in. csg.

Humble O. & R. Co. No. 1 M. Galt, R. Winn Sur. 1½, S.E. Talco; elevation 246 ft.; Georgetown 3,444-4,169 ft.; top Paluxy 4,185 ft.; S.D. 4,349 ft.

Humble O. & R. Co. No. 2 Groves, B. Jones Sur. Elev. 352 ft.; top Paluxy 4,- 133 ft.; oil sd. 4,196 ft.; S.D. 4,355 ft.

Joiner No. 1 Huernish hrs. Drlg. 4,375 ft.

Magnolia No. 1 Carr, M. V. Delgado Sur. Elev. 371 ft.; T.D. 4,151 ft.; to set csg.

B. C. Morrison No. 1 L. Sanders, C of Lot 1, Blk. 30, Talco townsite. Drlg.

Nemo Oil Co. No. 1 Talco School Dist., 150 ft. out of SE cor. of 5-ac. tr., I. P. Stern Sur. Drlg.

Ownby Drlg. Co. et al No. 1 F. Jones, C Lot 6, Blk. 16, M. V. Delgado Sur. Drlg.

EAST TEXAS

(Border Counties)

Cass County

American Liberty Oil Co. No. 1 Marcus Rembo, J. H. Reeves Sur. P.B. 6,072 ft. to 6,010 ft.; cmtd. 7-in. csg. at 5,993 ft.

American Liberty Oil Co. No. 2 Maxie, John Collum Sur. Drlg. 5,511 ft.

American Liberty Oil Co. No. 3 Maxie, John Collum Sur. Drlg. 5,047 ft.

McElvane et al No. 1 Heckett, John Collum Sur. Drlg. 4,752 ft.

R. W. Norton No. 2 Haywood, Priscilla Evans Sur. Drlg. 4,752 ft.

R. W. Norton No. 2 Mary Rives, John Collum Sur. Cg. 6,003 ft.

Texas Co. No. 1 E. E. Hall, James Young Sur. Drlg. 4,058 ft.

United Gas Pub. Ser. Co. No. 1 Eva Fields, John Collum Sur. Drlg. 4,586 ft.

United Gas Pub. Ser. Co. No. 2 Eva Fields, John Collum Sur. Drlg. 3,745 ft.

American Liberty No. 4 Maxie, J. Collum Sur. Drlg. 200 ft.

United Gas Pub. Ser. Co. No. 1 L. J. Cunningham, W. Robinson Sur. Loc.

United No. 2 Fields, J. Collum Sur. Drlg. 3,210 ft.

United No. 1 Simpson, 660 ft. N of Texas Co. No. 1 Hall, J. Young Sur. W.O.C. 321 ft.

United No. 1 J. J. Stewart, J. Collum Sur. Drlg. 2,687 ft.

Harrison County

A. C. Payne et al's No. 1 Lowery, E. D. Spain Sur. P.B. to 3,524 ft.

Marion County

Ed S. Holman's No. 1 Henderson, R. Bennington Sur. P.B. to 2,442 ft.

Panola County

George Hudson et al's No. 1 J. F. Nall, McGeary Sur. Set 8-in. 40 ft.; fshg. for core bbl. at 2,345 ft.

Geo. Le Grand No. 1 P. J. Wardleigh, A. Thompson Sur. Set 10-in. 62 ft.

N. C. TEXAS WILDCATS

Archer County

Continental Oil Co. No. 1 J. J. Perkins, Lot 47, Blk. 5, C.&P. Sur. Spud.

Deep Oil Dev. et al No. 1 Wilson, sec. 76, A.T.N.C. lands, W.O.C. 2,226-34 ft.; P.B. to S.O. wtr.

Pace Pet. Co. No. 1 J. Dardek, T.E.&L. Sur. No. 1,582. Drlg. 1,400 ft.

Perkins & Cullum No. 1 Young, sec. 27, Harris. Drlg.

Wilson-Ligon No. 1 M. B. Kolb, Blk. 116, Harris Subd. R.U. and S.D.

D. L. Wolf No. 1 J. W. Hasson, I.&G.N. Sur. A-239. Loc.

Baylor County

Consolidated Oil Co. No. 1 Portwood BB, T.E.&L. Sur. No. 1,573. O.S. 1,376-79 ft.; W.O.C.; drlg. plug.

K. R. March No. 1 W. B. Self, A. Hines A-156. Drlg. 1,220 ft.

Cooke County

Anderson & Kerr No. 1 C. A. Stelzer, T. B. Stroud Sur. No. A-950. S.D. 2,000 ft.

Anderson & Kerr No. 1 A. Wilson, Strong Sur. A-930. Drlg. 1,600 ft.

Cain & Chandler No. 1 J. B. Burch, J. McWilliams Sur. A-658. Drlg. 450 ft.

Joe Grazier No. 1 E. P. Bell, F. J. Lindheimer Sur. A-571. Loc.

Hardin Oil Co. No. 1 J. G. Bonner, J. Lindheimer Sur. S.D. 2,150 ft.

B. H. Hilburn No. 1 Hugan, A. Myers Sur. No. A-640. Drlg. 606 ft.

Keil & Keil No. 1 J. J. Perkins, B,B.B.&C. Sur. A-164. Drlg. 685 ft.

Lanier et al No. 1 Thetford, S.P.R.R. Sur. A-987. Drlg. 1,530 ft.

Hank Masterson No. 1 R. J. Timms, J. W. McPherson Sur. A-696. Trace oil; drlg. 1,878 ft.

F. W. Merrick, Inc., No. 1 L. P. Bell, J. S. Martin Sur. A-699. Drlg. 1,108 ft.

N. Newburn No. 1 Dotson, Wm. Campbell Sur. A-238. S.D. 1,542 ft., drill pipe.

Nixon Bros. No. 1 W. R. Harper, W. W. Pettit Sur. A-812. Material.

Petroleum Producers No. 1 J. W. Mount, J. C. Meeks Sur. A-758. T.D. 1,650 ft.; P.B. and tstg.; D.D. to sd. 1,660-70 ft.; T.D. 1,730 ft.; tstg.

E. R. Robison No. 1 J. Kreba, H. Wilkey Sur. A-1,090. Drlg.

W. F. Russell No. 1 Belle Payne, Marshall University Sur. A-620. Drlg. 1,258 ft.

J. M. Russell et al No. 1 H. B. Bawley, Blk. 24, John Barnett Sur. C.O. 720 ft.

Seitz, Comegys & Seitz No. 1 Field & Bowers, L. Raney Sur. A-878. Location.

Sunray Oil Co. et al No. 1-A A. C. McCall, W. H. White Sur. A-1,134. S.D. 4,-720 ft.; cmtd. 10-in.

B. F. Thompson No. 1 F. Trubenback, P. Davidson Sur. A-337. Drlg. 765 ft.

United Prod. Co. No. 1 Mount, S.P.R.R. Sur., sec. 9. Drlg. 1,324 ft.

Whitehead et al No. 1 W. Reed, F. Earthman Sur. A-349. Drlg. 790 ft.

Woodbine Oil Co. No. 1 Potter & Potter, J. Gorham Sur. Lowering 8-in.

Denton County

Oil Finance Corp. No. 1 J. S. Gambill, T. Burress Sur. S.D. 1,042 ft.

C. S. Hoad No. 1 Travelers Insurance Co., Wm. A. Thompson Sur. A-1,238. S.D. 857 ft.

Manning & Moore No. 1 E. L. Darnell, I. Walters Sur. A-1,339. R.U.R.

Foard County

Humble O. & R. Co. No. 1 Burnett, sec. 16, Blk. X, S.P.R.R. Sur. Fishing 3,210 ft.

Jack County

Bryson Oil & Gas Co. No. 1-G. E. Evett, Geo. Hardesty Sur. A-394. T.D. 4,100 ft.; U.R. pipe.

S. B. Edwards No. 1 Bryson, J. Hughson Sur. A-256. R.U.R.

Engineers Oil Co. No. 1 Cooke, J. Young Sur. 10-in. parted; fsg. 2,225 ft.

W. H. Hammon No. 1 G. E. Evett, H. Plaster Sur. S.D. 600 ft.

W. H. Hammon et al No. 1 W. H. Rhodes, R. N. Erwin Sur. A-1,378. Drlg. 1,460 ft.

Harper Pet. Corp. No. 1 Van Hooser, J. W. Morrow Sur. A-1,926. S.D. 1,400 ft.; on dope.

C. Kadane No. 1 E. F. Smith, S.P.R.R. Sur. A-552. Drlg. 1,295 ft.

Nelson Oil Synd. No. 1 J. P. McCoy, A. S. Ensworth Sur. Est. 40 bbls.; P.O.P.

Panhandle Ref. Co. No. 1 Klingiesmith, M. Hamilton Sur. A-262. S.S.O. 2,910-11 ft.; test O.S.; drlg. 3,270 ft.

Ray & Staniforth No. 1 L. J. Hester, J. Ash Sur. A-8. Drlg. 2,550 ft.

Sterntexx Oil Co. No. 1 Boyd, J. N. Wright Sur. A-898. O.W.D.D. at 3,340 ft.

Montague County

E. T. Hart No. 1 W. L. Davis, sec. 13, Jack Co. School Lds. Drlg.

Jim Seeds et al No. 1 Coombs, sec. 44, M.E.P.&P. Sur. Drlg. 1,475 ft.

J. M. Holmes No. 1 H. D. Field, sec. 53, M.E.P.&P. Sur. A-526. S.D.

A. H. Rosenburger No. 1 C. O. Meador, J. English Sur. A-214. R.U.R.
Southwest Pet. Co. No. 1 W. S. Petty, S. A. Southerlin Sur. A-992. Spud. and S.D.

Wichita County

Fisher & Moore No. 1 Gibson, sec. 302. Sand 1,834-60 ft.; C.O. 1,935 ft.
Pete Harmon et al No. 1 J. B. Jamison, J. Deck Sur. A-52. Drlg. 150 ft.
Reno Oil Co. No. 1 W. T. Waggoner-D, sec. 1, S.&M. Sur. A-393. Drlg. 1,570 ft.

Wilbarger County

Franklin Oil Co. No. 1 D. G. Feller et al, sec. 108, Blk. 14, H.&T.C. Sur. S.D. 1,570 ft.
Lane & Simons No. 1 Allison, sec. 43, H. &T.C. Sur., Blk. 12. S.D. 965 ft.
Pois & Schultz No. 1 W. T. Waggoner, sec. 103, H.&T.C. Sur., Blk. 14. Drlg. 1,510 ft.
Smith No. 1 S. A. Dill et al, sec. 32, Blk 14, H.&T.C. Sur. S.D. 2,090 ft.
L. Webb No. 1 J. L. McCrary, sec. 64, H.& T.C. Sur., Blk. 14. Drlg. 1,700 ft.

Young County

Curtis & Bracken No. 1 Allar Co., H Garmes Sur. A-104. P.B. to 3,800 ft.; est. 50 bbls., 3,725-50 ft.; treating with acid; flowing 5 B.P.H.
C. D. Neff et al No. 1 W. A. Dennis, C. F Bass Sur. Drlg. 3,190 ft.
Pitzer West et al No. 1 W. R. Dollins, T.E. &L. Sur. 615. Drlg.
Pitzer & West No. 1 Harrell, J. Daily Sur. A-78. Drlg. 3,460 ft.
Pitzer & West No. 1 S. L. Thornton, sec. 1,015, T.E.&L. Sur. A-824. Drlg. 4,203 ft.
Rathke Oil Co. No. 2 J. T. Rogers, S. H. Graham Sur. A-124. Drlg. 4,210 ft.
Roy Weggener No. 1 J. W. Davis, T.E.& L. Sur. 752, S.D. 320 ft.
Texas Co. No. 1 Stephens, T.E.&L. 1,985. Drlg. 885 ft.

East Texas Fields

(Continued from Page 260)

4 Frederick, 3,565-3,658 feet, 30 bbls. in 30 minutes.

American Liberty (formerly Cordova-Union) No. 10-B C. O. Christian, 3,682-3,702 feet, pumping 7 bbls. per hour. Magnolia Petroleum Co. No. 13 C. C. Still, 3,648-3,680 feet, 25 bbls. in 12 minutes. Natural Petroleum Co. No. 2 J. Henderson, 3,586-3,614 feet, pumping 5 bbls. per hour; No. 4 Henderson, 3,580-3,600 feet, pumping 5 bbls. per hour. Tide Water No. 15 C. O. Christian, 3,692-3,740 feet, 20 bbls. in 15 minutes. Adams & Lyle No. 4 A. Kersh, 3,628-3,631 feet, 35 bbls. in 45 minutes. R. E. Campbell No. 1 I. W. Wooley, 3,576-3,687 feet, pumping 5 bbls. per hour. Everetts Drilling Co. No. 6 Sam Overton, 3,619-3,620 feet, 135 bbls. per hour. Gant-Garvin-Wegner No. 6 Goldsberry, 3,570-3,585 feet, 20 bbls. per hour. Gilcrease Oil Co. No. 6 D. Bradford, 3,596-3,652 feet, 30 bbls. per hour. Humble Oil & Refining No. 12-B R. A. Barksdale, 2,526-3,610 feet, 19 bbls. in two hours, gas lift; No. 13-B R. A. Barksdale, 3,566-3,651 feet, 18 bbls. in two hours; No. 20 C. J. Thompson, 3,649-3,688 feet, 40 bbls. per hour. No. 15-A Turner, 3,684-3,712 feet, 76 bbls. per hour.

Alex McCutchin No. 4 Thompson, 3,584-3,701 feet, 20 bbls. per hour. Marathon Oil Co. No. 11 J. Lundsford, 3,690-3,710 feet, 60 bbls. per hour. Perot Oil Co. No. 1 B. D. Sealsback, 3,550-3605 feet, pumping 10 bbls. in three hours. Royal Petroleum Co. No. 1-B J. W. McDavid, 3,514-3,590 feet, pumping 20 bbls. in six hours.

Smith County

Sinclair Prairie Oil Co. No. 64-A Mayfield, 3,766-3,767 feet, 20 bbls. in 15 minutes. Sun Oil Co. No. 28 Knight, 3,625-3,626 feet, 52 bbls. per hour; No. 4 Lanham, 3,862-4,664 feet, 25 bbls. in two hours on pump.

E. C. Perry, rec. No. 5 J. C. Bateman, 3,751-3,752 feet, 30 bbls. in 30 minutes. Sun Oil Co. No. 5 M. Burns, 3,736-3,737 feet, 17 bbls. per hour. Algier Oil Co. No. 12 T. Wells, 3,714-3,718 feet, 60 bbls. per hour. B. G. Barnett No. 2 Cannon, 3,707-3,774 feet, pumping 20 bbls. P. E. Carter No. 1 O. F. Medlin, 3,748-3,749 feet, 65 bbls. per hour. Conservative Oil Corp. No. 8 Mackey, 3,679-3,680 feet, 20 bbls. in 40 minutes.

Upshur County

Mayhugben & Creslawn Corp. No. 5 Widner, 3,688-3,704 feet, 30 bbls. per hour. Manziel No. 3 Mackey, 3,728-3,730 feet, 30 bbls. per hour. Persky and others No. 1-B Callahan, 3,706-3,738 feet, dry and abandoned. Star No. 1-A fee, 3,610-3,615 feet, 40 bbls. per hour. Wise & Jackson No. 1 Callahan, 3,665-3,681 feet, 25 bbls. in four hours. Ypsalanti Oil Co. No. 2 Mackey, 3,670-3,688 feet, 25 bbls. per hour.

Petroleum Veteran Is Proud of Sons

Among the veterans of the petroleum industry expected at the International Petroleum Exposition which opens in Tulsa May 16 is L. L. Dimit of Neosho, Mo. He was born in 1851 in Allegheny County, Pennsylvania. His first work in the oil fields was as a "water boy" at the age of 11 years. In 1867 at the age of 16, he secured his first straight time job in the fields of Butler County, Pa., as a pumper for Jonathan Watson & Co. (Brewer, Watson & Co., 1853; Pennsylvania Rock Oil Co., 1855). In 1870 he went to the Parker's Landing field in the employment of Shealds Adams & Co., later becoming connected with Bettman, Watson & Bernheimer. In 1898, he was transferred to Grant County, Indiana, and thence to Bellmount, W. Va. The firm then became the Hudson Oil Co. and in 1900, he went to the Indiana fields, as superintendent of all departments of the company in that state until 1916, when he was transferred to Bowling Green, Wood County, Ohio.

Following the westward trend he removed to Oklahoma in 1918 at Mor-

L. L. DIMIT

ris. In 1919, he entered the service of the Gypsy Oil Co., with which he remained until retirement at the age of 76, in 1927.

The thing in which Mr. Dimit takes most pride is not his record, but his sons: W. H. Dimit, Fly, Ohio; J. L. Dimit, Gulf Oil Corp., Sapulpa, Okla., and C. P. Dimit, vice president Phillips Petroleum Co., Bartlesville, Okla. "Three practical oil men is my contribution to the petroleum industry," he says.

GREETINGS

to visitors

at the

NINTH INTERNATIONAL PETROLEUM EXPOSITION

PHILLIPS PETROLEUM COMPANY

BARTLESVILLE, OKLA.

WHOSE BUSINESS IS BETTER THAN EVER BEFORE

PROBLEMS FROM READERS

Edited by T. F. Smiley

What Is the Effect of Cement on the Collapsing Strength of Casing?

There are three questions I want to ask: 1. Is the collapsing strength of a casing string increased by the cement ring around it? 2. In the measurement of permeability of an oil sand what is meant by a 'millidarcy?" 3. The discussion of "Energy Relations Involved in Flowing Through Tubing of Producing Well" which you published in your issue of November 21, 1935, was of particular interest to me. I wish you would tell me where I can get copies of the studies referred to in the bibliography accompanying the article.—P. T., Rumania.

Your question concerning the collapsing strength of casing strings is difficult to answer because it would be hard to determine the force exerted by the cement set back of the casing. For the collapsing strength of the casing, however, the following is quoted from Empirical Formulae:

Lap weld .....P = 86,730 t/D-1,388
Seamless grade "C" .....P = 119,600 t/D-1,915
Seamless grade "D" .....P = 151,350 t/D-2,422

Where P = external pressure in pounds per square inch.
D = outside diameter in inches.
t = wall thickness in inches.

The formulae are derived from experimental data as incorporated in latest A.P.I. collapse figures. They do not apply mathematically where t/D is less than .038, but are approximately correct down to t/D = .025.

If the space behind the casing were filled with cement, the casing would be protected against collapsing because fluids could not circulate in the annular space between casing and drill-hole.

"Darcy" is defined as "the rate of flow in milliliters per second of a fluid of one centipoise viscosity through a cross section of one square centimeter of a porous medium, under a pressure gradient of one atmosphere (76.0 cm. Hg.) per centimeter and conditions of viscous flow." Dimensionally the permeability constant may be expressed as:

$$(k) = (L^2)$$

For convenience the sub-unit may be used:

millidarcy = 0.001 darcy.

Or write to Industrial Engineering Chemistry, Mills Building, Washington, D. C., for the first two references given in the bibliography to which you refer. For the last reference write to the American Petroleum Institute, 50 West Fiftieth Street, New York.

Proration Seen as Having Had Both Beneficial and Harmful Effects

I happen to be interested in the question of what kind of results have been obtained from proration since it was put into effect some nine years ago. Has it done what was expected of it in leveling off production and in other ways, such as maintaining reasonably profitable prices for crude and keeping supply in balance with demand? Was the proration program put into effect in the Seminole field in 1927 the first time this system had been tried?—N. D. E.

Proration of oil fields comprehends a system of quotas designed to restrict production to estimated demand. As you probably know, the estimated demand is allocated to the various fields within a state and to the individual leases making up the fields by state regulatory bodies or cooperative committees. Enforcement of the regulations is based on state laws prohibiting waste. The system of proration did not come into being all at once. It had small beginnings, meeting with only a fair degree of success. It still may be regarded as in a process of evolution. The first experiments with the plan were the results of emergencies and they were abandoned after the emergencies passed. When proration was adopted in the Seminole field in 1927 it was regarded as an expedient to handle a temporary period of overproduction. At first it was a voluntary undertaking, localized in a single area, but as overproduction continued to be a threat in that area and others, the project widened its scope and became institutionalized through legislation in various oil-producing states.

The proration system has had far-reaching effects, some beneficial, some unfavorable. Upon which side the balance lies may be a subject of divergent views. Following is a summarization presented by Joseph E. Pogue, consulting engineer, before the American Institute of Mining and Metallurgical Engineers:

Proration sustained oil prices for a period, but did not prevent an eventual decline. Permitted the accumulation of a large hidden "inventory" in the form of the crude oil potential (i.e., drilled-up but suppressed production). Led to a major overdevelopment of marketing facilities as a terminal expression of the crude oil potential. Led to a proliferation of state regulatory laws and brought the industry into the political arena. (At the same time it led to advancement in the scope of state conservation laws.) Contributed to a change in the price concept, weakening the role of price as a mechanism for equalizing supply and demand and furthering idea of price as a reward of merit. Built up a method of production control for balancing supply and demand in a volumetric sense, but in so doing stimulated disparity between the pressure aspects of supply and demand. Caused a major advance in the technique of crude oil production by forcing many fields to be operated under the efficiencies of unit operation.

WHY THEY CALLED IT *Bolt*

Nobody seems to know the origin of the word "bolt" beyond the fact that it has descended from an Anglo-Saxon word spelled the same way and designating a shaft or missile intended to be shot from a crossbow or catapult; especially, a short, stout blunt-headed arrow. The definition of a bolt attributed to a Troy, N. Y., high high school girl had at least the merit of originality. Students, undergoing examination, were asked to "Describe a bolt and a nut, and explain the difference, if any." The girl wrote: "A bolt is a stick of hard metal such as iron, with a square bunch on one end and a lot of scratching wound around the other end. A nut is similar to the bolt only just the opposite, being a hole in a little chunk of iron sawed off short, with wrinkles around the inside of the hole."

Inside Corrosion of Pipe Lines Offers Problem Remaining to Be Solved

I have read numerous articles on fighting pipe line corrosion caused by soil conditions, but I have discovered a line attacked from the inside. The oil run through this line has a high sulfur content. I am at a loss what to do. In fact, I am doubtful if anything can be done except to put in a new line. (It is a short one.) I never have read anything on how to deal with this kind of corrosion, and I would be glad to have any suggestions you can give me.—N. S. S.

The trouble you have encountered is among the most difficult ones that have developed in pipe line work. You will find of special interest an exhaustive article on this subject by Walter F. Rogers, of the Gulf Oil Companies, in The Oil and Gas Journal of October 24, 1935. This department is indebted to Mr. Rogers for the following brief discussion of your problem:

Internal corrosion is much more serious than soil corrosion because while the latter is in spots and usually not more than 5 to 10 per cent of the entire length of a line is affected during a 20-year period, internal corrosion occurs continuously in the line, affecting it from end to end and, eventually resulting in complete destruction. Internal corrosion is particularly serious because its presence is difficult to ascertain. Inspection of the pipe must be carried to the point of cutting pipe from the line and splitting it open in order to determine whether or not attack has occurred. The difficulty and expense of this prevent a thorough determination of the actual internal condition. Inspection is often postponed until the damage has been done and the appearance of rust holes through the pipe reveals the condition that has developed.

When major oil lines first were laid to West Texas to handle sulfide production it was assumed that the velocity of the oil would prevent internal corrosion from occurring. Such, however, has not been the case. During the last few years rust holes from the interior have appeared in several trunk lines from West Texas. This has raised apprehension as to the seriousness of this problem and studies have been made in the hope of controlling or eliminating the corrosion.

The average service life obtained in handling sulfide crudes from the older Gulf Coast oil fields approaches eight years as a maximum. Internal corrosion of main trunk lines is not as fast as that of gathering lines, but development of rust holes through the interior of West Texas sour-oil trunk lines shows that rapid attack is occurring. Pipe line station manifolds and suction lines will have average service lives approaching 10 years.

The internal corrosion attack can be reduced or stopped by removing either or both the hydrogen sulfide or the water from the crude oil. No method for removing the hydrogen sulfide economically has been found. The only practical means of handling the water so it will not result in rapid attack of gathering lines is to lay the lines at a slope so the settled water can move by gravity to catch basins. For trunk lines it has been determined that certain velocities will prevent brine and sediment from settling in the pipe.

It is important that air be kept from the sulfide bearing oil if possible. This can best be accomplished by the use of vapor-tight lease equipment and tight pipe line storage tanks. The use of oxygen free gas systems on these tanks to prevent oxygen access during breathing periods will result in lessened corrosion losses to both the pipe lines and the tank equipment. Cement-lined pipe is recommended as a corrosion-resistant pipe for gathering and suction lines.

QUESTIONS ON TECHNOLOGY

By Charles K. Francis, Ph.D., Technical Editor

The Early Experiments and Patents Relating to Cracking

The discovery of the cracking of petroleum is frequently mentioned as being accidental. Could you give me more details of this, as to the person and where?—T. S. C.

The fact that a hydrocarbon oil could be "cracked," changed in properties, was known to chemists long before it became of any commercial importance. Professor Silliman in the now famous report to Eveleth, Bissell and Reed, April 16, 1855, concerning his examination of the "rock oil," collected from the waters of Oil Creek, when describing the distillation points directed attention to the two higher fractions (Nos. 5 and 6) which distilled at lower temperatures than the distillate preceeding.

He stated: "The uncertainty of the boiling points indicates that the products obtained at the temperatures named above, were still mixtures of others, and the question forces itself upon us, whether these several oils are to be regarded as educts, (i. e., bodies previously existing, and simply separated in the process of distillation,) or whether they are not rather produced by the heat and chemical change in the process of distillation. The continued application of an elevated temperature alone is sufficient to effect changes in the constitution of many organic products, evolving new bodies not before existing in the original substance."

This report, first published in full in The American Chemist, 2, 18, 1871, was republished in The Oil and Gas Journal, September 9, 1926, page 170.

What has been mentioned as the accidental discovery of cracking was the observation said to have been made by a stillman in a Newark, N. J. refinery in 1861. After being away from the still, which was on the kerosene fraction, for four hours found the stream running a lighter gravity then when he had previously tested it. The explanation being that a part of the distillate had condensed on the upper, cooler, portion of the still and fell back into the hot oil where it was converted into the product having a lower boiling point. However, Luther Atwood's U. S. Patent 28, 246, May 15, 1860, describes an operation for the separation and condensation of the heavier parts of the vapors and the continual return for further heating.

Another early patent was the English Patent No. 3345 to James Young, which relates to cracking under pressure.

An extensive review of the early patents concerning petroleum may be found in Industrial and Engineering Chemistry, 9, 879, 1917.

Determination of Bromine Number of Petroleum Liquids and Greases

What is the method for arriving at the bromine number of gasoline and other petroleum products?—R. O. F.

From 0.2 to 2 grams of the sample are weighed directly or by difference, into a 300 to 500 cc. bottle which is fitted with a glass stopper. Dissolve the grease or oil in 10 cc. carbon tetrachloride, then add 20 cc. of bromine solution (one-third N bromine in carbon tetra chloride), delivering from a burette. Let stand for two minutes. If a special bottle fitted with a dropping funnel is not available, a thin piece of rubber tubing may be slipped over the mouth of the bottle in such a way as to make a well into which the iodide solution may be poured.

Cool the bottle in cracked ice. Pour part of 20 to 30 cc. of mm. potassium iodide solution (20 per cent solution in water) into the well and lift the stopper just a little to permit the iodide solution to be sucked into the bottle. Shake the bottle and repeat the addition of iodide solution until there is no more suction, add any remaining iodide solution and finally titrate with N/10 sodium thiosulfate solution, with repeated shaking, until the yellow color has almost disappeared. Next add a few drops of starch solution (0.5 gm. pure starch in 50 cc. cold water, brought to boiling, with constant stirring, and cooled) and continue the titration until the disappearance of the blue color. This gives the iodine liberated by the excess bromine. The total quantity of bromine added is found from a blank; the difference in the total bromine absorption. This is converted by calculation to per cent of the sample.

The contents of the bottle are next transferred to a separating funnel, and the aqueous solution is separated and filtered. If it be blue, it is decolorized by a few drops of thiosulfate solution, and the free acid is determined as hydrobomic acid by titration with decinormal alkali, methyl-orange being used as an indicator. The bromine calculated from the hydrobromic acid and expressed in per cent of the sample gives the bromine substitution value. Twice this number subtracted from the total bromine absorption furnishes the bromine addition number.

It is obvious that the substitution number must be doubled, since for each bromine atom converted into hydrobromic acid, there has been removed from the original bromine solution 1 molecule (or 2 atoms of bromine), as is explained by the following equation:

$$\underset{\text{Fatty acid}}{C_nH_{n}O_2} + Br_2 = \underset{\text{Bromosubstitution product}}{C_nH_{n-2}O_2Br} + HBr$$

The N/10 thiosulfate solution contains 24 gms. of the salt in a liter of water. This is standardized as follows: Potassium bichromate, pure, 3.8657 gm. in 1,000 cc. water. Place in a stoppered bottle 10 cc. of a 10 per cent potassium iodide solution, 5 cc. of hydrochloric acid and run in exactly 20 cc. of the bichromate solution from a burette.

Since each cc. of this solution liberates 0.01 gm. iodine, 0.2 gm. of iodine will be liberated. When this is titrated with the sodium thiosulfate solution the value will be obtained and may be converted to bromine. One cc. N/10 thiosulfate solution is equivalent to 0.007992 gm. bromine.

References: McIlhiney, J. Amer. Chem. Soc., 21, 1084, 1899. Chem. Technology and Analysis of Fats and Waxes, Lewkowitsch, 6 ed. Vol. 1, page 402.

SPECIFICATIONS

PAINT THINNER, VOLATILE MINERAL SPIRITS

This specification applies to petroleum distillates, volatile mineral spirits, used for thinning paints by federal departments.

Appearance — Free from water and suspended matter.

Color—21 Saybolt.

Spot test—Five drops shall evaporate completely from filter paper in 30 minutes.

Flash—Not below 86° F. closed Tag.

Blackening—Negative copper strip 30 min. boiling.

Distillation—Maximum 5 per cent at 266° F. not under 97 per cent at 466° F.

Acidity—Distillation residue negative.

Reference: Federal Standard Stock Catalog, Sec. 4, Part 5, TT-T-291, A.S.T.M. Standards, D 56-21.

Liquefying Natural Gas Also Pressure for Measuring Gas

At what pressure does natural gas become liquid? We have 1,500 pounds pressure at our wells and wonder if the gas was not liquid at this pressure. How many cubic feet of gas is contained in 1 gallon of liquid natural gas? When metering gas from the well what pressure should be used—W. B. F.

Natural gas is essentially methane, for which the critical temperature is −115.8° F. The temperature at the bottom of a well is always considerably higher than this, consequently the gas cannot be in the liquid form no matter what the pressure may be. The critical pressure for methane is 673 pounds per square inch. Therefore when the pressure is above 673 pounds and the temperature below 115.8° F. methane will become liquid.

It is the practice to assume, for estimating purposes, that 1 gallon of natural gasoline is equivalent to 35 cubic feet of gas. There are 23.6 cubic feet of gas per pound of methane at 60° F. Close figures could be obtained only when the exact composition, the pressure and temperature were known. One easy method is to find the molecular composition, which expressed in pounds will represent the volume of 379 cubic feet, the standard pound, mol, at 60° F.

Usually the measurement of natural gas, if not fixed by contract, follows the system of the U. S. Department of Interior used for determining the volume of gas sold or subject to royalty payments. This is required to be 10 ounces above at atmospheric pressure of 14.4 pounds/square inch, regardless of the atmospheric pressure at the point of measurement, and 60° F. All measurements of gas shall be reduced by computation to these standards, no matter what may have been the pressure and temperature at which the gas was actually measured.

Lube and Grease Plants Outside of Refineries in the United States

How many plants are there in the United States for the manufacture of lubricating oils and greases that are not connected with a refinery? How much do they make? Any information about these plants will be appreciated. —A. C. L.

The only statistics we have found relating to establishments outside of refineries engaged in the manufacture of lubricating oils or lubricating greases are those of the Fifteenth Census, Manufactures 1929, under Petroleum Refining. The quantity of products is not shown.

There were 177 nonrefinery lubricating oil and grease plants reported for the United States. These establishments are engaged primarily in manufacturing and compounding of lubricating oils and greases from mineral, animal and vegetable oils and fats. The base material, used in the largest quantity, either alone or in combination with other products, is partly refined petroleum lubricating oil.

The total number of persons employed was 4,093, who received $7,905,686 for the year 1929 in wages and salaries. The cost of materials, containers, fuel and purchased energy was $39,571,373. The products made were valued at $47,077,021 for the lubricating oils; $17,349,837 for the greases, and $5,157,388 for other products; making a total of $69,584,246 as the value of the products manufactured.

Questions on Petroleum Technology may be sent to Dr. Charles K. Francis, The Oil and Gas Journal, Tulsa, Okla. When a copy of the answer is desired postage should be enclosed.

PERSONAL

STANLEY S. STINSON has been riding the ranch trails and caliche covered pastures scouting wildcats in the Permian Basin for the past 11 years for the Humble Oil & Refining Company. Stan was born and raised in Rochester, Ind. His first oil field work was with the Mexican Gulf Oil Company at Tampico, Mexico, from August, 1913, to 1915, inspecting construction of a loading wharf on the Panuco River and later timekeeper and paymaster on construction on the company's terminal which was located about 6 kilometers up the Panuco River from Tampico. From that job he went with the engineering department of the state of Arizona. In 1919 he went with the Louisiana Oil & Refining Company in the engineering department at Shreveport, and later was with the Continental Petroleum Company and Tidemex Oil Company in Mexico.

FLOYD MILLER, Bay Oil Company geologist, returned to Tulsa from Houston, Tex., where he was stationed for a short time.

H. E. (DOC) SCHWARTZ, geologist, formerly with the Texas Company in the Panhandle, is now located at Pampa, Tex., doing consulting work.

E. G. WOODRUFF, consulting geologist, Tulsa, and MRS. ANNA S. WOLFE were married in Tucumcari, N. Mex., on May 2 and are returning to Tulsa to make their home here about June 15.

W. G. GISH, manager of the Sinclair Prairie's Texas headquarters, and H. SMITH CLARK, chief of the geological staff of the company in Texas, were in Tulsa, visitors to the company's Tulsa headquarters in the past week.

C. E. TOWNSEND of Philadelphia, Pa., manager of the insurance department of the Sun Oil Company, visited Twin State Oil Company offices in Tulsa recently, the latter company being a subsidiary of the Sun Oil Company.

CLIFF E. SAVAGE, assistant chief scout for Carter Oil Company, who sustained a fractured leg some time ago while in Pauls Valley, Okla., has recovered sufficiently to be removed to his home from the hospital in Tulsa.

BURTON C. DUNN, late of Pittsburgh, Pa., is a recent addition to the geological staff of Marathon Oil Company at its Tulsa headquarters. He is a graduate of Pittsburgh University of Pittsburgh, Pa., but attended Princeton University two years.

DR. F. L. FLACK, chief surgeon for the Sinclair Prairie Companies, flew by airplane from Tulsa to Casper, Wyo., several days ago to attend C. R. PARRISH, superintendent of the pipe line department of the Sinclair-Wyoming Oil Company. Mr. Parrish was reported convalescing from a serious illness.

JOHN M. LANGSTON, chief scout for Sun Oil Company, Dallas, Tex., heading a committee including JOHN G. PEW, with the same company; ERNEST WILSON, American Maracaibo Oil Company; R. B. WHITEHEAD, chief geologist for the Atlantic Oil Producing Company; J. E. REGENT, Sun Oil Company; A. J. CUNNINGHAM, California Company, and BEN F. JONES, Republic Production Company, all of Dallas, Tex., have been making arrangements for the National Oil Scouts Association Convention, in Dallas, May 29-30.

GEORGE TAYLOR, geologist for Continental Oil Company, has been transferred from Ponca City to the McPherson, Kansas, district.

ROBERT H. COLLEY, of Philadelphia, Pa., treasurer of the Atlantic Refining Company, has also been elected vice president of the company.

T. A. MORGAN, director of conservation for the Kansas Corporation Commission, was in southeastern Kansas the past week conferring with operators in the stripper areas.

L. L. TRAVIS and BERNE HOLLINGSWORTH, East Texas and Panhandle producers and drilling contractors, entered the North Louisiana play last week. Travis and Hollingsworth arrived in Shreveport May 5 and said they expected to work from that point indefinitely.

JESS BULLARD, scout for the Shell Petroleum Corporation, San Antonio, Tex., and president of the National Oil Scouts Association, was in Dallas over the week-end to discuss further preparations for the association's convention to be held in that city on May 29-31.

JAMES B. BLACK, president of the Pacific Gas & Electric Company with offices in San Francisco, will be one of the principal speakers at the forthcoming annual convention of the California Bankers' Association May 21 which will be held in the state capitol at Sacramento.

FREEMAN W. BURFORD, president of the East Texas Refining Company, Dallas, has been named as representative of the state of Texas and personal representative of GOV. JAMES V. ALLRED at the inauguration ceremonies when R. W. LECHE is made governor of Louisiana at Baton Rouge on May 12.

Do You Remember?

From The Oil and Gas Journal Files

25 YEARS AGO

The Standard Oil Company of New Jersey is declared an illegal trust under Sections 1 and 2 of the Sherman Act by the Supreme Court of the United States and is given six months in which to break itself up into separate corporations.

Englishmen are drilling for oil in Tunis, Africa, and report that Bore hole No. 1 on Plot 238 has reached a depth of 13 sagenes.

Arthur J. Hull, Oklahoma and Illinois oil producer, is also vice president of the Bessemer Gas Engine Company.

Miss Hermania Kaessmann is said to be the only woman oil refiner in the country. She heads the Sunflower State Refining Company at Niotaze, Kans.

20 YEARS AGO

Many operators are paying Oklahoma's new 3 per cent gross production tax under protest pending the result of a suit to declare the tax unconstitutional.

Roxana Petroleum Co. (Royal Dutch-Shell) will erect refineries in Cushing, Okla., and New Orleans, La.

William Warncastle, pioneer nitroglycerin man, who started with the inventor Dr. Roberts, and ended with Du Pont Powder Co., dies in Toledo, Ohio.

Charles W. Harkness, Standard Oil Co. official and stockholder, who died May 1, left an estate estimated at $150,000,000. The widow and a brother of the deceased are the largest beneficiaries, but considerable money was left to charities.

10 YEARS AGO

The cracking capacity of the refineries of the United States is 980,960 barrels daily. The crude skimming capacity of these same refineries is 1,951,960 barrels a day.

On May 15 Mid-Continent crude oil prices ranged from $1.65 per barrel for 28 gravity oil up to $3.57 for 52 degrees and over, with 36 gravity at $2.29 per barrel.

E. J. Gorman, general manager of the Twin State Oil Company, is elected vice president of the company.

M. E. WAGNER, vice president, Marathon Oil Company, Tulsa, has been visiting his mother in Greenville, Ohio.

MARVIN LEE, geologist and technical advisor of the Kansas Corporation Commission, was in Wyoming on private business the past week.

A. L. DAY is the new Tulsa sales representative for the Perdue Tank Company, of McPherson, Kans., distributors of Columbian steel tanks.

J. EMERSON SMITH, director of public relations for Continental Oil Company, Ponca City, Okla., visited several points in Kansas on business the past week.

CLIFFORD W. LORD, of Los Angeles, Calif., who has acted as president of the Bolsa Chica Oil Company for the past several months since the death of WILLIAM FORD, has been officially elected to that office.

SEWELL THOMAS, a Denver attorney, and W. E. RENNIE, geologist, have organized Mineral Rights, Inc., to buy and sell royalties in eastern Colorado. Mr. Thomas was elected president and Mr. Rennie vice president.

BRUCE CLARDY, formerly in the crude oil purchasing department of Shell Petroleum Corporation, is supervising from Shreveport, La., operations of three rigs running in that territory for the firm he is now with, Heyser, Heard & Clardy.

KARL WALTERS, geologist for Continental Oil Company, has been transferred from the company's Denver, Colo., office to Wichita, Kans. JAKE JULIAN recently was transferred from Ada, Okla., to Wichita as land man for Continental.

PARAGRAPHS

H. L. ALBRECHT, treating engineer for Dowell, Inc., has been transferred from Tulsa to Midland, Tex.

W. C. IMBT of Urbana, Ill., geologist, has been transferred to the Midland, Tex., office of Stanolind Oil & Gas Company.

W. L. TEBBS has been named superintendent of production for the Iron Mountain Oil Company and will have headquarters at Fort Worth. Tex. Mr. Tebbs was formerly with the Oil Well Supply Company.

B. H. PEACOCK, superintendent of the Lone Star Gasoline Company, Ranger, Tex., and DEAN HYATT, safety director for the Texas Pacific Coal & Oil Company, composed the committee on general arrangements for the Oil Belt Safety Meet held in Ranger, Tex., on April 2.

RICHARD T. EASTELL, of Pittsburgh, Pa., president, and G. C. JOLLY, of Crothers, Pa., general superintendent, of the Washington Oil Company are inspecting Mid-Continent flooding operations in Nowata and Rogers Counties, Oklahoma, and expect to visit the International Petroleum Exposition in Tulsa. The Washington Oil Company drilled its first well in Washington County, Pa., in 1888, at which time it was a subsidiary of the Standard Oil Company (New Jersey).

W. L. McKENZIE, managing director of Sunshine Oils, Ltd., has returned to Lethbridge, Alberta, from Vancouver, British Columbia.

J. W. SELBY, chief scout for the Shell Petroleum Corporation at Houston, Tex., made a tour of inspection through the Laredo district last week.

E. H. BLUM, vice president of the Atlantic Oil & Producing Company at Dallas, Tex., was a business visitor to the company's offices at Houston last week.

M. C. HOOVER, scout for the Shell Petroleum Corporation with headquarters at Kilgore, Tex., was a business visitor to the company's offices at Houston the past week.

A. F. CRIDER, Shreveport geologist and a veteran in the Louisiana, Ark., and East Texas border territory, was a business visitor last week in El Dorado and Smackover, Ark.

RALPH STEINMAN, chief scout for the Sinclair Prairie Oil Company at Tulsa, spent two days in Houston the past week while on a tour through the various Texas districts.

E. H. STEVENS addressed the Rocky Mountain Association of Petroleum Geologists at Denver on May 4 on "Some Problems of the Heart Mountain Thrust near Cody, Wyoming."

J. R. McWILLIAMS, Shreveport, vice president of Standard Oil Company of Louisiana, was among Louisiana oil men attending the Arkansas Conservation Board's meeting at El Dorado, Ark., May 4, at which development regulations were discussed for the new deep producing pool opened by Phillips Petroleum Company on the northeast edge of the Smackover field.

D. R. SNOW, vice president of the Barnsdall Oil Company, with GEORGE A. SCHWAB, head of the land department, and E. A. MARKLEY, chief geologist, looked over the North Louisiana fields in the past week.

EARL STRATTON, combination land man and scout for the Texas Company in the Panhandle, with headquarters at Amarillo, has been transferred to the Fort Worth division offices of the company. "JUDGE" GRANT, formerly in the Panhandle production department, will fill the vacancy at Amarillo made by the transfer.

DR. HAL P. BYBEE, geologist and mineralogist of the Texas University Lands Board, has been appointed head of the geology department of the University of Texas and will move from San Angelo, where he has lived for several years, to Austin. He succeeds DR. FREDERICK W. SIMONDS, who is retiring after 46 years of service. Doctor Bybee was formerly connected with the geology department of the university for 11 years, until 1925.

TUCKER ROYALL, former chairman of the Texas State Tender Board, banker and oil man of Palestine, Tex., has been named chairman of the board of the First National Bank in Dallas, Tex., and is to move to that city. Mr. Royall has also been named toastmaster for Palestine's Petroleum Party, to be held in that city on May 15 by the Palestine Chamber of Commerce.

BOB RICHIE, with the Continental Supply Company at Big Springs, Tex., has been transferred to Kermit, Tex.

PAUL L. GUARIN has been transferred from the East Texas field to the Houston, Tex., offices of the Shell Petroleum Corp., to take charge of mechanical engineering department.

Still Call Him "Britzie"

Although he is director of sales for the Rio Grande Oil Company now and a member of the board of directors, H. E. Britzman is still "Britzie" to his friends, and likes it. He is one of the growing number of young men heading toward higher executive posts in the oil industry.

H. E. BRITZMAN

Mr. Britzman was born in Missouri and after finishing high school he attended Northwestern University, Evanston, Ill., and the University of Colorado, Boulder, where he studied law. Instead of taking up a legal career following his graduation from the latter institution he engaged in the advertising and publishing business in Colorado and for several years he was directory publishing manager for the Mountain States Telephone & Telegraph Company. In 1929 he entered the service of the Rio Grande Oil Company as advertising manager and since then he has been advanced steadily.

While advertising manager Mr. Britzman launched and edited the Rio Grande News, which attained a high rating as a house organ. At the same time he acquired a multitude of friends in the California oil industry. When the Sinclair Consolidated Oil Company acquired control of Rio Grande Mr. Britzman continued as advertising manager and his success in handling the work of his department resulted in his being made director of sales in 1932. At the same time he was made a director of the company.

RAY STEVENS, scout for the Shell Petroleum Corporation at Houston, Tex., is spending a week's vacation at his home in Dallas.

G. W. McGREW, with the Consolidated Oil Company, with headquarters at New York, was a business visitor to the company's offices at Houston the past week.

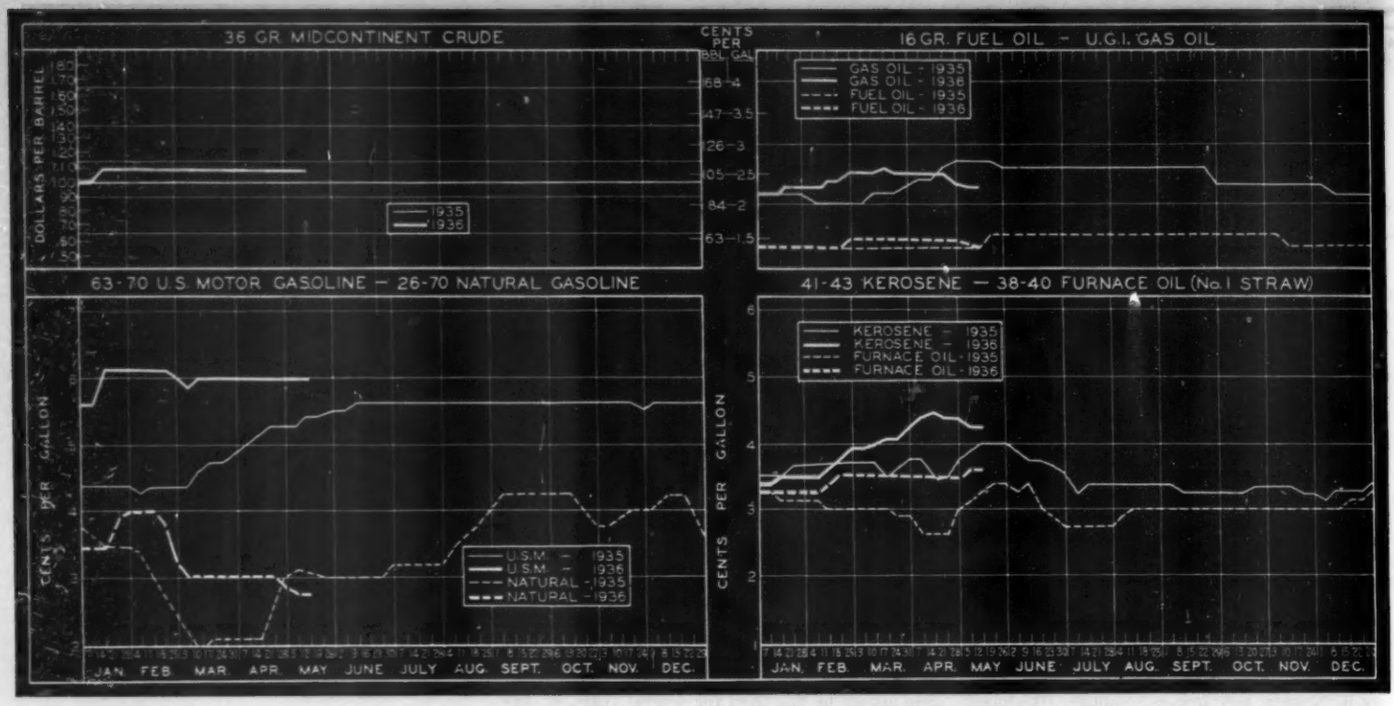
V. V. POLIAKOV, vice president and chief engineer of Glavoneft, and his associate, L. F. KORNEENKOF, both from Russia, have been making a tour of the East Texas field during the past week.

EUGENE C. FELT, of the Warrior Petroleum Company, and GEORGE LILLY, of Hoosier Petroleum Company, both of Indianapolis, were in Tulsa last week on their way home after a trip through Indiana.

E. G. SIEVERS, engineer and attorney for the Internal Revenue Bureau and department of justice, recently returned to Washington, D. C., after several weeks spent on cases involving litigation in Oklahoma.

S. F. PRATT, manager, and J. E. MOORHEAD, executive secretary of the Pennsylvania Grade Crude Oil Association, of Oil City, Pa., are visiting the western trade and attended a meeting of Colorado jobbers of Pennsylvania oil in Denver on May 8. Mr. Moorhead formerly resided in Denver.

K. A. SCHMIDT, geologist, who had charge of geophysical work leading to the discovery of the Cayuga and Long Lake pools in Anderson County, East Texas, is now supervising shooting parties of Tide Water Oil Company and Seaboard Oil Company in northern Louisiana and southern Arkansas with offices in Shreveport.


36 GR. MIDCONTINENT CRUDE
DOLLARS PER BARREL
1935
1936
CENTS PER BBL. GAL
16 GR. FUEL OIL - U.G.I. GAS OIL
GAS OIL - 1935
GAS OIL - 1936
FUEL OIL - 1935
FUEL OIL - 1936
63-70 U.S. MOTOR GASOLINE — 26-70 NATURAL GASOLINE
CENTS PER GALLON
U.S.M. - 1935
U.S.M. - 1936
NATURAL - 1935
NATURAL - 1936
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
41-43 KEROSENE — 38-40 FURNACE OIL (No.1 STRAW)
KEROSENE - 1935
KEROSENE - 1936
FURNACE OIL - 1935
FURNACE OIL - 1936
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.

Representative Mid-Continent Quotations on Crude Oil and Refined Products, Basis Oklahoma (Group 3)

Refined Gasoline Weak, But Naturals Firmer in Group 3 Market Area

By T. F. SMILEY

Softness which long had been apparent in the Group 3 tankcar gasoline market assumed more concrete form in the last week when prices of the third-grade and middle-octane material sagged. The 68-70 or regular grade was holding, but by a precarious grip, and refiners were not overconfident of its ability to stick. The retail market continued shaky, and the impossibility of establishing a firm wholesale market without the support of a firm retail market was conceded. Local cutting of service-station prices, which began several weeks ago in Oklahoma and in other parts of the Group 3 consuming area showed no signs of cessation.

Refiners and marketers found a little reason for encouragement in the fact that week-end motor fuel consumption in northern territory was heavier than had been recorded at any previous time this year. Highways were reported thick with pleasure cars, stirring hope that belated reduction in the country's huge gasoline stocks may at last be getting under way. Tending to dampen optimism, however, were the broadening volume of offerings in the open market. These offerings were said to be coming largely from East Texas, with other parts of the Mid-Continent contributing generously. In the face of this material seeking outlets, the low-octane gasoline from Rodessa was reported to be experiencing harder going.

Contract Movement Brisk

Contract movement of gasoline was brisk. Jobbers, who evidently have been maintaining low stocks, were ordering out material in lively fashion to fill immediate needs. Some refiners reported instructions were far in excess of expectations. Spot business, however, was in need of a powerful tonic. While the trade generally was spiritless, it was agreed that a week or so of really fine motoring weather would work a marked change. Rains in the last week over many drouth-ridden areas acted as a stimulant to gasoline demand.

Natural gasoline, with last week's prices still prevailing, was showing a distinctly better undertone, and some in the trade expressed belief the bottom of the downward movement had been reached. Three cargoes shipped or ordered have done much to revive a market which had been slipping. In addition to one cargo already shipped to California from the Gulf Coast for distribution among some of the smaller independent refiners, inquiries for a second were reported this week. Orders for two more cargoes helped to steady the market. One was said to be for shipment to England and the other for coastwise shipment. Jobber buying has been stimulated by the lower prices now in effect. There has been increased business in 14-, 18- and 22-pound material; but as these grades enter into competition with third-grade refined gasoline, the business has reacted in some measure on the demand for 26-70. More than 400 cars of low-vapor-pressure material are reported to have been purchased in the Mid-Continent region in the last week or so for movement to the Gulf Coast. Natural gasoline manufacturers for the most part express satisfaction over the outlook. They point out that at this time last year the naturals were recovering from a slump in which the 26-70 grade had gone to 2 cents.

Plowing has been stimulated by recent rains, with consequent increase in the demand for tractor fuels. This material was reported by some refiners to be well sold up. The call for tractor fuels has spread over to kerosene and light furnace oils.

Bright Stocks Up

Bright stocks continued their upward movement, annexing another half cent. Steam-refined stocks also were up. The improved position of bright stocks is regarded as a sequel to heavy export shipments since July, 1935. The largest orders were from Italy, but other European nations, particularly England, France and Germany, were also substantial buyers. Export buying has slowed up somewhat. There is no reason to suppose bright stocks would have reached their present price level if there had been nothing but normal domestic consumption to move them, particularly as the tendency in this country is toward use of lighter oils. Inquiries for wax were few.

Refined Oil Market Barometer

Weak spots in the retail market, along with increased offerings from refiners, were unfavorable factors this week in maintenance of the wholesale gasoline price structure. At the same time the position of natural gasoline had improved, largely because export orders and requirements of independent refiners on the West Coast afforded an outlet for unneeded material in the Mid-Continent.

MID-CONTINENT. Gasoline easy. Naturals steadier. Lubricants up.

EAST COAST. Gasoline spotty. Kerosene and fuel oil firm. Lubricants strong.

GULF COAST. General market dull.

PENNSYLVANIA. Bright and cylinder stocks up. Gasoline, fuel oil, kerosene soft.

CALIFORNIA. Gasoline firmer. Kerosene stronger. Natural gasoline up.

CHICAGO. Tankcar gasoline market soft, but consumption rising. Kerosene easier.

Eastern Gasoline Market Developing Somewhat of "Spotty" Appearance

NEW YORK, May 11.—The eastern gasoline situation developed a somewhat "spotty" appearance during the past week. Further anticipated improvement in the southern New Jersey markets materialized when Standard Oil Co. and other majors advanced both tank-wagon and retail prices to levels in line with the Philadelphia market across the Susquehanna River, which had been restored to normal last week. It is reported that a few marketers have not yet readjusted their prices in this area, however.

In Boston, perhaps the weakest spot in the eastern retail gasoline markets at present, the situation has not improved. Prices in this area are approximately 2 cents per gallon out of line, a sufficient margin seriously to eat into local marketing profits. In New York state, outside of the New York metropolitan district, the Socony-Vacuum Oil Co. has adjusted prices in various localities to meet competition. This has resulted in reductions of one-half cent in Ossining and advances of one-half cent in Sacketts Harbor and Watertown, in the northern part of the state. At Waverly, N. Y., the company advanced its prices a full cent. In Norwalk, Conn., the company reduced quotations one-half cent.

In connection with the mixed appearance of the market at this time, the fact must be mentioned that weather conditions, on the whole, have been unfavorable up to the past three days. However, a hot spell has overtaken the entire east, with the north Atlantic seaboard sweltering under temperatures approaching 90 degrees. There is every indication that this weather will continue over the week-end. Coupled with clear skies, it foreshadows a very material increase in consumption.

A further reassuring indication in the market is the firm status of the refinery market, which appears to be edging above the 7-cent mark in the local area. While the major refiners are still maintaining a 7-cent offering price, it is reported some of the smaller units are asking as high as 7¼ cents. This reflects the scarcity of tankcar offerings, which were in greater evidence two or three weeks ago than at present.

It is becoming increasing evident that the spottiness of the tank-wagon and retail markets at present is due more to the efforts on the part of marketers to build up a large retail market at the beginning of the summer, in order to take the fullest advantage of the season, than to offerings of distress or inferior quality gasoline. If this view of the situation proves reliable, a general improvement should be looked for later on, provided there is no change for the worse in the basic situation.

The retail trade here looks with increased misgivings at the steadily mounting crude oil production figures for the nation as a whole. With an investigation of motor fuel markets already under way, a renewal of the crude "overproduction" hue and cry in the industry would have a highly detrimental effect on the retail markets, it is believed. Reports emanating from Washington also state that the administration is all set to place the alleged waste of oil resources before the electorate as a major issue in the presidential elections. As one oil man puts it: "The oil industry could not pick a worse time to overproduce than at present."

Reports from the Southwest, however, clearly indicate that at least a portion of the operators in the field are becoming alive to the dangers in the situation and are planning to restrict production. It is believed that there is time to correct the situation so that the industry can maintain its currently strong position.

Eastern kerosene and fuel oil markets continue firm. Diesel oil for marine use and bunker fuel oil are in the strongest position with the demand reported above expectations. The long-expected advance in bunker fuel oil prices, however, thus far has failed to materialize.

Lubricating oils, greases, paraffin wax and petrolatums are strong. Aside from Pennsylvania cylinder stocks and bright stock, however, there has been no material improvement in prices. This is considered to be due mostly to ample stocks on hand, from which the consumer is getting the benefit.

Export Markets

A distinctly improved tone in the export markets is in evidence. Although the Gulf Coast export markets have not responded to any extent, the underlying situation abroad is said to be distinctly on an upward trend. The Rumanian markets, for one thing, appear to be firming up. Recently there was a flurry of buying of Rumanian oil from central European sources. This has died down, but it has left the trade in a better frame of mind than has been the case for many months.

Another factor affecting sentiment in the oil export field is the claims now being put forth by Turkey in connection with certain oil concessions in Iraq. While the producing companies in Iraq do not regard such claims as valid, this situation, which appears largely political, coupled with some recent labor difficulties in Iraq, make it appear likely that any further plans for expansion of the production there will be postponed, for the time being at least. On the other hand, plans appear to be definitely under way providing for a further expansion of production in the Bahrein Island field, with the accompanying development of refining and marketing outlets in some of the principal European countries.

Statistics recently available regarding the sale of new motor cars in France points to greatly increased consumption of gasoline and auto lubricants in that country. It is understood that this trend is evident in other countries of Europe, although probably not so pronounced. New cars sold in France in the first two months of 1936 aggregated 24,172, against 18,508 in the same months of 1935, an increase of no less than 30 per cent. In Austria, there has been a gain of 42 per cent in pleasure cars on the road, but due to heavy restrictions on truck transportation, the number of trucks has actually declined by 7 per cent.

In Germany, the government is said to be organizing the operation of trucks under a central authority with the idea of developing truck transportation of merchandise on a scale never before reached in this country. It is becoming rather common to see long trains of these trucks moving over the highways. This country seems to have placed relatively few restrictions on the importation of gasoline, but has been active in seeking new outside sources of supply.

In an unusually frank statement regarding the situation abroad, the Standard Oil Co. of New Jersey stated in part:

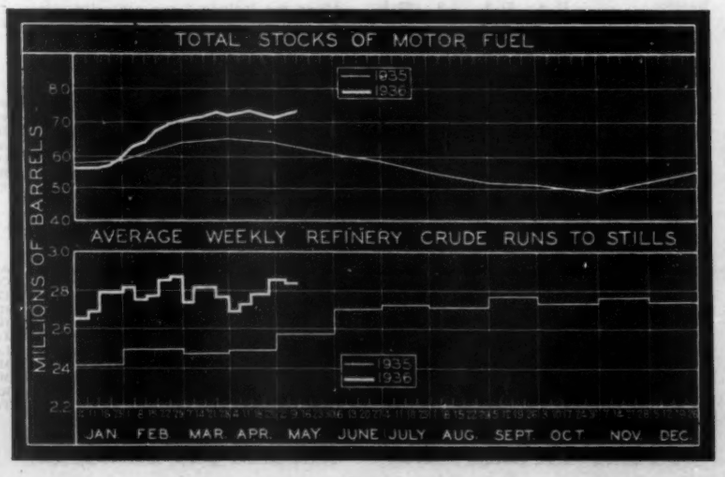
"Unsettled economic and political conditions throughout the world have resulted in the development of a high degree of nationalism in some foreign countries leading to the most costly and uneconomic practice of governments requiring the building of local refineries to handle imported crude and the carrying of inventories in excess of normal requirements." In view of the steady gain in consumption of petroleum products abroad, despite these restrictions, it can be seen that there is a great undeveloped potential market awaiting the time when these foreign nations adopt a more enlightened policy with regard to the importation of petroleum products, on which most of them fully depend for their oil requirements.

A. P. I. Weekly Refinery Statistics

Week Ending May 9, 1936

	Capacity reporting (per cent)	Daily crude runs (bbls.)	Total gasoline stocks	Gas oil and fuel oil stocks
East Coast	100.0	494,000	20,446,000	7,692,000
Appalachian	94.8	97,000	2,698,000	437,000
Indiana, Illinois, Kentucky	95.9	400,000	11,270,000	3,057,000
Oklahoma, Kansas, Missouri	84.8	287,000	7,588,000	2,587,000
Inland Texas	48.5	99,000	1,595,000	1,673,000
Texas Gulf	96.8	596,000	8,324,000	6,422,000
Louisiana Gulf	96.4	124,000	1,776,000	1,988,000
North Louisiana and Arkansas	90.0	50,000	417,000	376,000
Rocky Mountains	61.9	41,000	1,556,000	734,000
California	92.6	503,000	12,951,000	71,313,000
Total reported	89.6	2,691,000	68,621,000	96,279,000
Estimated unreported	.....	179,000	4,868,000	2,271,000
*Estimated total	.....	2,870,000	73,489,000	98,550,000
*Estimated total previous week	.....	2,875,000	72,964,000	96,709,000
†May 31, 1935	.....	2,594,000	61,483,000	100,177,000

*Bureau of Mines basis currently estimated. †Monthly report, U. S. Bureau of Mines.



RETAIL OIL MARKETS

Tank-wagon and filling station prices on gasoline and kerosene furnished by the larger marketing firms

Prices as of May 12, 1936

Taxes

The gasoline quotations given in the following tables include the 1-cent federal tax, as well as state, county and city taxes. The gasoline is the regular or standard grade. In most areas a third grade and a premium grade are also available.

Discounts

Under the standard form of commercial consumer contract which went into effect March 1, 1934, save in California, Oregon, Washington, Arizona and Nevada, a discount of 1 cent a gallon off tank-wagon or 3 cents a gallon off retail prices is permitted for purchases between 4,000 and 10,000 gallons per month, or 4 cents a gallon off retail prices for purchases in lots of more than 10,000 gallons a month. The minimum delivery is 25 gallons.

Standard Oil Co. (Indiana)

	Gasoline Tank wag.	Gasoline Serv. sta.	Gasoline Inc. tax	Kero. tank wag.
Chicago	15.0	17.0	4.0	10.1
Decatur, Ill.	16.0	18.0	4.0	10.1
E. St. Louis	15 7	17.7	4.0	9.8
Joliet	16.0	17.0	4.0	10.1
Peoria	16.0	18.0	4.0	10.1
Quincy	15.8	17.8	4.0	9.9
Davenport, Ia.	16.0	(†)	4.0	10.1
Des Moines	15.8	(†)	4.0	9.9
Mason City	16.2	(†)	4.0	10.3
Sioux City	16.0	(†)	4.0	10.1
Duluth, Minn.	16.8	18.8	4.0	10.9
Mankato	16.4	18.4	4.0	10.5
Minneapolis	16.4	18.4	4.0	10.5
LaCrosse, Wis.	17.4	19.4	5.0	10.5
Green Bay	17.7	19.7	5.0	10.8
Milwaukee	16.3	18.3	5.0	10 4
Madison	17.4	19.4	5.0	10 5
Detroit, Mich.	14.0	16.0	4.0	8.8
Grand Rapids	16.4	18.4	4.0	9.2
Saginaw	16 6	18.6	4.0	10.1
Evansville, Ind.	17 7	19.7	5.0	10.6
Indianapolis	17.9	19.9	5.0	10.8
South Bend	18.1	20.1	5.0	11.0
Fargo, N. Dak.	17.4	19.4	4.0	11.5
Huron, S. Dak.	17.9	19.9	5.0	11.0
Sioux Falls	17.4	19.4	5.0	10.5
Kans. City, Mo.*	15.4	17.4	4.0	8.0
Springfield	15.1	17.1	4.0	9.2
St. Louis	15.7	17.7	4.0	9.8
St. Joseph*	15.4	17.4	4.0	9.5
Wichita, Kans.	14.9	16.9	4.0	7.1
Bartlesville, Ok.	15.0	19.0	5.0	8.5

*State tax 2 cents, 1-cent city tax and 1-cent federal tax.

†Standard Oil Co. (Indiana) has leased all service stations in Iowa.

Discounts to dealers except in Iowa: 2½ cents on premium and regular and 2½ cents on third grade off service station prices; discounts to dealers in metropolitan Chicago one-half cent larger than rest of Standard of Indiana territory, namely 4 cents and 3 cents on respective grades. Dealers in Iowa sold at posted "Dealer Prices."

Stanolex Fuel Oil in Chicago

Effective February 10, 1936, f.o.b. Chicago tank-wagon prices: Range oil, less than 100 gallons, 8.75 cents; 100-149 gallons, 7.75 cents; 150 gallons and more, 7.25 cents. 1 (26-40 lt. stw. zero), less than 100 gallons, 8.75 cents; 100-149 gallons, 7.75 cents; 150 gallons or more, 7.25 cents; No. 3. (22-26 zero), less than 150 gallons, 7.5 cents; 150 gallons or more, 6.5 cents; No. 4 (12-16 zero), less than 400 gallons, 7.5 cents; 400 gallons or more, 6.5 cents, viscosity of No. 4, 35° and 100° F.; No. 5, less than 400 gallons, 5.75 cents; 400 gallons or more, 4.75 cents.

Rocky Mountain District

CONTINENTAL OIL CO.

	Gasoline Tank wag.	Gasoline Serv. sta.	Gasoline Inc. tax	Kero. tank wag.
Denver, Colo.	18.0	20.0	5.0	11.0
Pueblo	18.0	20.0	5.0	13.0
Grand Junction	21 5	23.5	5.0	15.0
Casper, Wyo.	19.5	21.5	5.0	11.5
Cheyenne	19.5	21.5	5.0	13.0
Butte, Mont.	21.0	....	6.0	14.5
Billings	22.5	24.5	6.0	14.5
Helena	23.5	24.5	6.0	17.5
Great Falls	20.0	22.0	6.0	14.5
Salt Lake, Utah	21.0	23.0	5.0	16.0
Twin Falls, Ida.	23.0	25.0	6 0	18.0
Boise	23.5	24.5	6.0	18.0
Albu'que, N. M.	18.5	20.5	*6.5	13.0

*Includes one-half cent city tax.

Discount to dealers with or without contract in Continental territory: Undivided dealer discount off service station price, 4 cents; divided dealer accounts, 3½ cents.

Southern District

STANDARD OIL CO. OF KENTUCKY

	Gasoline Tank wag.	Gasoline Serv. sta.	Gasoline Inc. tax	Kero. tank wag.
Atlanta, Ga.	20.5	22.5	7.0	*13.5
Augusta	20.0	22.0	7.0	*13.0
Macon	20.0	22.0	7.0	*14.5
Savannah	18.5	20.5	7.0	*13.0
Birm'ham, Ala.	21.0	23.0	8.0	12 0
Mobile	21.0	23.0	8.0	12.0
Montgomery	22.0	24.0	9 0	14.5
Jackson, Miss.	20.0	22.0	7.0	*13.0
Vicksburg	19.5	21.5	7.0	*13.0
Jacksonville, Fla.	18.0	20.0	8.0	12.0
Miami	19.5	21.5	8.0	13 5
Pensacola	21.5	23.5	9.0	12.0
Tampa	18.0	20.0	8.0	12.5
Lexington, Ky.	19.0	21.0	6.0	11.0
Covington	18.5	20.5	6.0	10.5
Louisville	18.5	20.0	6.0	10.0
Paducah	18 0	19.0	6.0	8.5

*Includes 1 cent state tax. Montgomery, Ala., has a county tax of 1 cent per gallon, and a city tax of 1 cent per gallon on gasoline, in addition to state tax; and 1 cent per gallon on kerosene. Mobile and Birmingham, Ala., each have a city gasoline tax of 1 cent per gallon. Pensacola, Fla., has a city gasoline tax of 1 cent.

Pacific Coast Territory

STANDARD OIL CO. OF CALIFORNIA

	Gasoline Tank wag.	Gasoline Serv. sta.	Gasoline Inc. tax	Kero. tank wag.
San Francisco	17.0	18.0	4.0	11.5
Los Angeles	16.5	17.5	4.0	9.0
Fresno, Calif.	17.5	18.5	4.0	11.0
Phoenix, Ariz.	21.0	22.0	6.0	‡16.0
Reno, Nev.	19.5	20.5	5.0	13.0
Portland, Ore.	19.5	20.5	6.0	13.5
Seattle, Wash.	19.5	20.5	6.0	13.5
Tacoma	19.5	20.5	6.0	13.5
Spokane	22.5	23 5	6.0	16.5

*Retail prices posted by Standard Stations, Inc., a subsidiary.

†Prices are at company's plant or depots, as company does not operate stations. A 4-cent per gallon discount is given dealers and customers taking tank-wagon lots except in Phoenix where discount is 1 cent.

‡Includes 5-cent state tax.

Atlantic Coast District

STANDARD OIL CO. OF NEW JERSEY

	Gasoline Tank wag.	Gasoline Serv. sta.	Gasoline Inc. tax	Kero. tank wag.
Atl'tic City, N.J.	14.3	17.3	4.0	9.0
Newark	14.3	17.8	4.0	7.5
Annapolis, Md.	15.6	19.1	5.0	10.0
Baltimore	15.0	18.5	5.0	8.0
Cumberland	16.6	20.1	5.0	12.7
Wash'g'n, D. C.	13.0	16.5	3.0	9.0
Danville, Va.	17.5	21 0	6.0	12.9
Norfolk	16 0	19.5	6.0	11.2
Petersburg	16.5	20.0	6.0	11.7
Richmond	16.5	20.0	6.0	11.7
Raonoke	17.5	21.0	6.0	12 9
Charles'n, W. Va.	15.8	19.3	5.0	12.6
Parkersburg	15.1	18.6	5.0	11.2
Wheeling	16.0	19 5	5.0	12.2
Charlotte, N. C.	18.7	22.2	7 0	12.9
Hickory	19.0	22.5	7.0	13.1
Mt. Airy	19.0	22.5	7.0	13.2
Raleigh	18 4	21.9	7.0	12.7
Salisbury	18.8	22.3	7.0	13.0
Charleston, S.C.	17.0	20.5	7.0	11.3
Columbia	18.3	21.8	7.0	12 6
Spartanburg	18.7	22.2	7.0	12.9

Tank-wagon gasoline refers to dealer instead of retail prices.

Price basis to dealers: Undivided dealers at regular price less one-half cent. Discount for kerosene, 1 cent off tank wagon price for 25 gallons or more under contract (contract not necessary in Baltimore) except in New Jersey, where no discount (if necessary) is given.

Nebraska

STANDARD OIL CO. OF NEBRASKA

	Gasoline Tank wag.	Gasoline Serv. sta.	Gasoline Inc. tax	Kero. tank wag.
Omaha	18 4	20.4	6.0	10.4
McCook	19.1	21 1	6.0	11.1
Norfolk	18.8	20.8	6.0	10.8
North Platte	19.2	21.2	6.0	11.2
Scottsbluff	19.9	21.9	6 0	11.9

Note—Discounts to dealers: where service station gasoline prices are (maximum overall, including rent) as follows: Reliance, 2½ cents; Standard Red Crown, 3½ cents; Red Crown Ethyl, 3½ cents.

Where service station gasoline prices are below normal resellers' allowances are reduced one-half of the amount below normal, down to the following (minimum overall, including rent): Reliance, 2 cents; Standard Red Crown, 3 cents; Red Crown Ethyl, 3 cents. Discounts to consumers for tank-wagon deliveries covered only by Standard Commercial Consumers Contract, effective January 1, 1935.

Pennsylvania, Delaware and Part of New England

ATLANTIC REFINING CO.

	Gasoline Tank wag.	Gasoline Serv. sta.	Gasoline Inc. tax	Kero. tank wag.
Philadelphia, Pa.	16.5	17.5	5.0	9.5
Pittsburgh	17.5	19.5	5.0	10.0
Allentown	17.0	17.0	5.0	9.5
Erie	17.5	18.5	5.0	8.0
Scranton	16.75	16.0	5.0	10.0
Altoona	17.5	19.5	5.0	9.5
Dover, Del.	17.0	17.0	5.0	10.0
Wilmington	16.5	16 5	5.0	9.5
Springf'ld, Mass.	14.0	17.5	4.0	7.5
Worcester	13.5	17.0	4.0	7.75
New Haven	13.0	16.5	4.0	7.5
Providence, R.I.	12.0	15.5	3 0	7.25

Note—Tank-wagon prices are those applicable to consumers purchasing lots of 100 or more gallons in one delivery.

Central South District

STANDARD OIL CO. OF LOUISIANA

	Gasoline Tank wag.	Gasoline Serv. sta.	Gasoline Inc. tax	Kero. tank wag.
N. Orleans, La.	18.5	22.0	‡9.0	12.0
Baton Rouge	17.5	21.0	‡7.0	11.5
Alexandria	18.5	22.0	†*8.0	11.0
Lafayette	19 0	22.5	†*8.0	12.5
Lake Charles	19.0	22 5	†*8.0	11.0
Shreveport	17.0	20.5	‡7.0	10.0
Knoxville, Tenn.	21.0	24.5	8.0	14.0
Memphis	19.0	22 5	8.0	11.0
Chattanooga	20.5	24.0	8 0	11.5
Nashville	20.0	23.5	8.0	10.0
Bristol	18.75	21.5	8 0	14.5

*Includes city tax of 1 cent.

†Includes 1-cent parish tax. ‡Includes 3-cent parish tax.

Tank-wagon gasoline refers to dealer instead of retail prices.

Price basis to dealers: Undivided dealers at dealer price less one-half cent.

Louisiana kerosene prices include 1-cent state tax.

New York and New England

SOCONY-VACUUM OIL CO., INC.

	Gasoline Post deal	Gasoline Serv. sta.	Gasoline Inc. tax	Kero. tank wag.
Albany, N. Y.	14.0	17.5	5.0	7.75
*Met. N. Y.:				
Manhtn., Bronx	14.2	19.2	5.0	7.25
Staten Island	1.2	19.2	.5.0	7.25
Qu'ns & Br'klyn	14 2	19.2	5.0	7.25
Buffalo	14.5	18 0	5.0	8.25
Rochester	14.5	18.0	5.0	8.25
Syracuse	14.5	18.0	5.0	8 75
Boston, Mass.	12.5	16.0	4.0	7.5
Portland, Me.	14.5	18.0	5.0	7.75
Manch'ter, N. H.	15.0	18.5	5.0	8.0
Burlington, Vt.	17.0	20.5	5.0	8.75
Hartford, Conn.	14.5	18.0	4.0	7 0

*Does not include 2 per cent city sales tax which is calculated on basis of net retail price exclusive of state and federal taxes.

Southwestern District

MAGNOLIA PETROLEUM CO.

	Gasoline Tank wag.	Gasoline Serv. sta.	Gasoline Inc. tax	Kero. tank wag.
Dallas, Tex.	13 5	17.0	5.0	8.5
Fort Worth	13.5	17.0	5.0	8.5
Houston	13.5	17.0	5.0	8.5
San Antonio	13.5	17.0	5.0	8.5
El Paso	15.0	19.0	5.0	8.0
Muskogee, Ok.	15.0	19 0	5.0	8.0
Okla. City	15.0	19.0	5.0	8.0
Tulsa	15.0	19.0	5.0	8.0
Ft. Smith, Ark.	15.5	19.0	5.0	8.0
Little Rock	18 0	21.5	7.5	9.5
Texarkana	14.5	18.5	5.0	8.5

Naphtha

STANDARD OIL CO. (INDIANA)

	Tank wagon*
Oleum spirits	15.7
V.M.&P. naphtha	16.0
Cleaners' naphtha	15.0
Stanisol	15.0

*Prices include 3-cent Illinois tax, but not 1-cent federal tax or 2 per cent retail occupational tax.

Prices f.o.b. Chicago. Each price subject to discount of 1 cent per gallon for 150-gallon lots if covered by contract.

Ohio

STANDARD OIL CO. OF OHIO

	Gasoline Tank wag.	Gasoline Serv. sta.	Gasoline Inc. tax	Kero. tank wag.
Ohio points	17.5	19.5	5.0	*12.5

*Includes state tax of 1 cent.

Canada*

Imperial 3-Star Gasoline
IMPERIAL OIL, LTD.

	Gasoline Tank wag.	Gasoline Serv. sta.	Gasoline Inc. tax	Kero. tank wag.
Hamilton, Ont.	21.0	23.5	6.0	17.0
Toronto, Ont.	21.0	23.5	6.0	17.0
Brandon, Man.	30.8	33.8	7.0	22.3
Winnipeg, Man.	29.2	32.2	7.0	20.7
Regina, Sask.	30.5	33.5	7.0	22.0
Saskatoon, Sask.	33.3	36.3	7.0	24.8
Edmonton, Alta.	32.7	35.7	7.0	24.2
Calgary, Alta.	30.0	33.0	7.0	21.5
Vancouver, B. C.	26.0	29.0	7.0	24.0
Montreal, Que.	19.5	22.0	6.0	17.5
St. John, N. B.	25.0	29.0	8.0	19.5
Halifax, N. S.	25.0	29.0	8.0	19.5

*Imperial gallon used in Canada.

Discount to dealers: Divided dealers pay 3 cents per gallon below station price; undivided dealers pay 4 cents per gallon below station price except in cities of Hamilton, Toronto and Montreal where discounts below station price are one-half cent per gallon less.

Retail Price Changes

Standard Oil Co. of Kentucky April 21 reduced tank-wagon gasoline .5 cent and station gasoline 1 cent in Louisville; April 29 advanced tank-wagon kerosene 2 cents in Mobile.

Rocky Mountain Runs

Estimated production in the Rocky Mountain area for week ended May 9, was as follows:

	Bbls.
WYOMING	
Salt Creek	16,750
Big Muddy	1,560
Badger Basin	40
Byron	1,470
Dallas Derby	570
Dutton Creek	50
Elk Basin	270
Ferris	10
Frannie	2,600
Grass Creek	600
Hamilton dome	2,530
Hudson	260
Hidden dome	100
LaBarge	1,300
Lance Creek	3,300
Lost Soldier	1,320
Midway	60
Oregon Basin	1,550
Osage	540
Pilot Butte	20
Quealy dome	90
Rock River	2,220
Poison Spider	120
Teapot	20
Warm Springs	170
Total Wyoming	37,780
MONTANA	
Buckley-Border	320
Cat Creek	630
Cut Bank	7,740
Dry Creek	80
Kevin-Sunburst	4,310
Lake Basin	50
Pondera	1,440
Total Montana	14,470
COLORADO	
Florence	270
Fort Collins and Wellington	370
Iles dome	3,180
Moffat	410
Orchard	30
Rangely	80
Tow Creek	190
Total Colorado	4,530
NEW MEXICO	
Artesia	650
Cooper area	8,150
Eunice area	17,960
Hobbs	26,340
Hogback	200
Jal	3,110
Lea	1,000
Maljamar	1,920
Monument	6,480
Rattlesnake	720
Table Mesa	90
Total New Mexico	66,630
Total Rocky Mountain region	123,410

PRICES OF REFINED PRODUCTS

All quotations f.o.b. plant in cars for interstate or export movement except as otherwise noted

Prices as of May 12, 1936

The following quotations are exclusive of the federal excise taxes of 1 cent a gallon on gasoline and 4 cents on lubricating oils.

Refinery Gasoline

OKLAHOMA (Group 3)—

U. S. Motor grades:		
62 octane and below	.04⅞	.05¼
63-67 octane	.05⅛	.05⅝
68-70 octane (regular)	.06	.06⅛
60-62 400 grades:		
62 octane and below	.05	.05⅛
63-67 octane	.05⅛	.05⅝
68-70 octane (regular)	.06	.06⅛
64-66 375	.05⅛	.05⅜
68-70 360	.05¼	.05⅝

NORTH TEXAS—

U. S. Motor grades:		
62 octane and below	.04⅞	.05⅛
63-67 octane	.05⅛	.05⅝
68-70 octane (regular)	.06	.06⅛
60-62 400	.05	.05⅛
64-66 375	.05⅛	.05⅜

NORTH LOUISIANA (Ark., N. La. and Miss. delivery)—

U. S. Motor grades:	
62 octane and below	.05⅜
63-67 octane	.06⅛
68-70 octane (regular)	.06⅜
60-62 400	.05⅜ .06

ARKANSAS (Ark., N. La., Miss. del.)—

U. S. Motor grades:	
62 octane and below	.05⅜
63-67 octane	.06⅛
68-70 octane (regular)	.06⅜

CHICAGO (Based on Group 3)—

U. S. Motor grades:		
62 octane and below	.04⅞	.05¼
63-67 octane	.05⅜	.05⅞
68-70 octane (regular)	.06	.06¼
60-62 400 grades:		
62 octane and below	.05	.05¼
63-67 octane	.05⅜	.05⅞
68-70 octane (regular)	.06	.06¼
64-66 375	.05⅛	.05¼
68-70 360	.05¼	.05⅝

PENNSYLVANIA (inland refineries)—

58-60 U. S. Motor:	
Below 60 octane	.05⅝
60-64.9 octane	.07
65-70 octane	.07¼
64-66 375	.05⅝
68-70 350	.06

CALIFORNIA (domestic movement)—

54-58 U. S. Motor	.06	.07
58-60 400	.06¾	.07¾

EAST COAST—

U. S. Motor, below 60 octane:	
*New York (Bayonne)	.06⅝
Baltimore	.06⅝
U. S. Motor, 60-64.9 octane:	
*New York (Bayonne)	.07
Philadelphia	.07
Boston	.07
Baltimore	.06⅝
Charleston, S. C.	.06⅝
U. S. Motor, 65 and above:	
*New York (Bayonne)	.07½
Philadelphia	.07¼
Boston	.07½
Baltimore	.07
Charleston, S. C.	.07

*All grades of gasoline one-eighth to one-fourth cent less for barge shipments. New York harbor prices are for New York and New England delivery. Prices for New Jersey delivery one-fourth cent lower.

GULF COAST (domestic)—

U. S. Motor grades:		
Below 60 octane	.05⅝	.05⅝
60-64.9 octane	.06	
65 octane and higher	.06⅛	.06¼

Naphtha

PENNSYLVANIA (inland refineries)—

50-52 450 (blending)	.05½
52-54 450 (blending)	.05⅝
54-56 450 (blending)	.05⅝

Natural Gasoline

OKLAHOMA (Group 3)—

Grade 26-70	.02⅝	.03
Grade 18-55	.03¼	.03⅛
Low vapor pressure grade:		
*14 lb. v.p. (max.)	.03¾	.04⅛
*12 lb. v.p. (max.)	.04⅝	.05

*Nominal.

NORTH TEXAS—

Grade 26-70		.02⅛
Grade 18-55	.03	.03¼

NORTH LOUISIANA (Ark., N. La. and Miss. delivery)—

Grade 26-70	.03⅛	.03¾

CALIFORNIA—

75-85 375-390	.05⅛	.06¼

Tractor Fuel

OKLAHOMA (Group 3)—

40-42 gr., 315-325 l.b.p., 110 flash, 540-550 e.p.	.04¼	.04⅝
41-43 gr., 300-350 l.b.p., 110-125 flash, 500-520 e.p.	.04¼	.04½
46-48 gr., 210-230 l.b.p., 480 max., e.p.		.05

Kerosene

(All kerosene water white)

OKLAHOMA (Group 3)—

41-43	.04¼	.04⅝
42-44	.04½	.04⅝

NORTH TEXAS—

41-43	.04⅝	.04⅞

NORTH LOUISIANA (Ark., N. La. and Miss. delivery)—

41-43	.04½	.04⅝

ARKANSAS (Ark., N. La., Miss. del.)—

41-43	.04⅝	.04⅝

PENNSYLVANIA (inland refineries)—

45	.05½
46	.05⅝
47	.05⅝

CHICAGO (Based on Group 3)—

41-43	.04⅜	.04½
42-44	.04½	.04⅝

CALIFORNIA (Pac. Coast market)—

38-40 high burning test	.03½ .05

NEW YORK (Bayonne, N. J.)—

*41-43	.04⅞

GULF COAST (domestic)—

41-43	.03⅞

*Barge price one-eighth cent lower.

Furnace Oil

OKLAHOMA (Group 3)—

No. 1 prime white, 38-42	.03⅞	.04
No. 1 straw, 38-40	.03⅝	.03⅞
No. 2 straw, 32-36	.03⅜	.03½
No. 2 dark, 32-36	.03½	.03⅝
No. 3, 28-32	.03	.03¼
No. 3, 15 and above, 28-32	.02⅜	.02⅝

NORTH TEXAS—

No. 1 prime white, 38-42	.03⅝	.03⅞
No. 1 straw, 38-40	.03½	.03⅝

NORTH LOUISIANA (Ark., N. La. and Miss. delivery)—

No. 2, 32-36	.03	.03¼

ARKANSAS (Ark., N. La., Miss. del.)—

No. 2, 32-36	.03⅜	.03⅝
No. 3, 28-32	.03¼	.03⅜

CHICAGO (Based on Group 3)—

No. 1 prime white, 38-40	.03⅜	.04
No. 1 straw, 38-40	.03½	.03⅝
No. 2 straw, 32-36	.03⅜	.03⅝
No. 2 dark, 32-36	.03½	.03⅝
No. 3, zero to 15, 28-32	.03	.03⅛
No. 3, 15 and above, 28-32	.02⅝	.02½

NEW YORK (Bayonne, N. J.)—

*No. 1	.04⅞
*No. 2	.04½
*No. 4	.04¼

*Barge deliveries one-eighth to one-fourth cent under above, tankcar price.

Gas Oil and Fuel Oil

(Gas oil per gal., fuel oil per bbl.)

OKLAHOMA (Group 3)—

U.G.I. gas oil	.02⅝	.02⅝
No. 4, 24-28	.95	1.00
No. 4, 15 and above, 24-28	.77½	.82½
No. 5	.72½	.75
No. 6	.62½	.67½
Below 18 fuel oil, industrial	.60	.65

NORTH TEXAS—

U.G.I. gas oil	.02⅝	.02⅛
No. 4, 24-28	.95	1.00
No. 5	.70	.75
No. 6	.62½	.67½
Below 18 fuel oil, industrial	.60	.65

NORTH LOUISIANA (Ark., N. La. and Miss. delivery)—

U.G.I. gas oil	.02⅝	.03⅛
10-14 fuel oil, industrial	.70	.75

ARKANSAS (Ark., N. La., Miss. del.)—

10-14 fuel oil, industrial	.60	.65

CHICAGO (Based on Group 3)—

U.G.I. gas oil	.02⅝	.02½
No. 4, 24-28	.95	1.00
No. 4, 15 and above, 24-28	.77⅛	.82½
No. 5, 18-22	.72½	.75
No. 6, 10-16	.62½	.67½

PENNSYLVANIA (inland refineries)—

36-40	.04⅝	.04⅞

CALIFORNIA—

Los Angeles:		
30-34 gas oil, per bbl.	1.00	1.20
24 plus diesel	1.00	1.25
24 plus diesel (bunkers)	1.10	1.30
12-16 (bunkers at tidewater)	.85	.95
10-16 (cargo lots)	.80	.95
12-17 (tankcars)	.70	.95
San Joaquin Valley:		
10-18 (tankcars)	.65	.75
San Francisco:		
24 plus diesel, per bbl.	1.30	1.35
24 plus diesel (bunkers)		1.35
10-16 (bunkers)		1.00

GULF COAST—

28-30 gas oil	.03¼	.03⅜
28-30 diesel (bunkers)		1.50
Bunkers (bulk cargoes)		.80
Bunker C (bunkers)		.90

NEW YORK (Bayonne, N. J.)—

27 plus, gas oil		.04⅝
28-30 diesel (lighterage 6¼ plus per bbl.)		1.65
28-30 diesel (tankers)		.04½
*Bunker C (to ocean-going ships in N. Y. harbor)		1.05
Industrial fuel (tankcars)		.04

*Lighterage charge 5c bbl. additional.

Bright and Steam-Refined

OKLAHOMA (Group 3)—

Bright Stocks:		
190-200 D, 15-25	.21½	
150-160 D, 0-10	.18½	
150-160 D, 15-25	.18	
150-160 E, 15-25	.17½	
100-110 D, 0-10	.17	
Steam refined:		
631 green (treated)	.13½	
600 dark green (untreated)	.06	.07½

PENNSYLVANIA—

Bright Stocks (Pennsylvania grade, No. 8 color, 145-50 at 510; 540-550 flash):		
10 pour test	.24½	.25
15 pour test	.23½	.24
20 pour test	.22½	.23
25 pour test	.21½	.22
Steam refined:		
600	.13½	.14
650	.14½	.15
600 Pennsylvania flash	.15½	.16
630 flash	.17½	.18
600 Warren E filtered	.15½	.16

Neutral Oil

(Vis. at 100° F. except Pennsylvania and color N.G.A.)

OKLAHOMA (Group 3)—

Zero to 10 Cold Test:		
150-3		.10
180-3		.11¼
180-4		.10⅝
200-3		.11⅜
200-4		.11¼
250-3		.13⅜
250-4		.13¼
280-3		.14⅜
280-4		.14¼
300-3½		.15¼
400-3½		.16
100-2 paraffin oil		.05⅝
15-20 Cold Test:		
200-3		.10⅜
200-4		.10¼
240-3		.12⅜
240-4		.12¼
280-3		.13⅜
280-4		.13¼

GULF COAST—

Pale Oils:		
200-3	.07	.07½
300-3	.07½	.08
600-3½	.08½	.09
750-3½	.09	.09½
1,200-3½	.09½	.09¾
2,000-4	.09¾	.10
Red Oils:		
200-5-6	.07	.07½
300-5-6	.07¼	.07½
500-5-6	.08	.08½
750	.08½	.09
1,200-5-6	.09	.09½

CALIFORNIA (moving to dom. market)

Pale Oils:		
100-2½-3		.06
200-2½-3		.06½
300-3-3½		.06½
400-3-4	.08½	.09¼
450-3-4	.09¾	.10
550-3-4	.10	.10¼
600-3-4	.10¼	.10½
Red Oils:		
200-4-5		.06
360-5-6		.06½
350-5-6	.07	.08
400-5-6	.08	.08¼
450-5-6	.08¼	.08½
500-5-6	.08½	.09
600-5-6½	.09	.09½
700-6½ plus	.09¾	.10
750-6½ plus	.10	.10¼
900-6½ plus	.10¼	.10½

PENNSYLVANIA—

150 vis. at 750° F., color, 400-405 flash:		
Zero pour test	.19	.19½
10 pour test	.18	.18½
15 pour test	.17½	.18
25 pour test	.16½	.17
180 vis. at 70° F., 3 color:		
25 pour test	.19½	.20
200 vis. at 70° F., 3 color:		
Zero pour test	.23	.23½
10 pour test	.22	.22½
15 pour test	.21½	.22
25 pour test	.20½	.21

Wax and Petrolatum

(Prices per pound)

OKLAHOMA (Group 3)—

124-126 (a.m.p.) w.c. scale	.02⅝	.02¾

PENNSYLVANIA (inland refineries)—

122-124 (a.m.p.) w.c. scale	.0255	.0260
124-126 (a.m.p.) w.c. scale	.0260	.0265

NEW YORK—

Wax in bags fully refined:		
123-125 (a.m.p.) wax		.0445
125-127 (a.m.p.) wax		.0455
128-130 (a.m.p.) wax		.0480
130-132 (a.m.p.) wax		.0505
133-135 (a.m.p.) wax		.0535
135-137 (a.m.p.) wax		.0560
124-126 (a.m.p.) w.s.	.0240	.0250
124-126 (a.m.p.) y.s.	.0240	.0245
Petrolatum in barrels, carload lots:		
Dark green		.01⅞
Amber	.02⅝	.03
Extra amber	.03	.03½
Lily white	.06⅝	.06⅝
Snow white	.07⅜	.07⅝
Cream	.05⅝	.05⅞

Export Prices

GASOLINE

GULF COAST—

U. S. Motor	.05⅝	.05½
60-62 400		.05½
61-63 390		.05⅝
64-66 375		.05⅝

LOS ANGELES—

U. S. Motor grades:		
53-55 octane		.04½
55-56 octane	.04½	.04⅝
65-67 octane	.04⅜	.05
67-69 octane	.05	.05¼
Above 69 octane	.05¼	.05½
65 and above 400 e.p.	.05½	.06

KEROSENE

GULF COAST—

41-43 prime white		.03⅞
41-43 water white		.04
44 water white		.04¼

LOS ANGELES—

41-43 water white	.04½	.05

LUBRICANTS

(Pennsylvania Grade)

NEW YORK (f.a.s. in bbls.)—

Cylinder Stocks:		
600 Warren E	.21	.21½
600 S.R. unfiltered	.19	.19½
650 S.R. unfiltered	.19½	.20
600 flash S.R.	.20½	.21
630 flash S.R.	.23½	.24
Bright Stocks:		
8 color		.26½
6½ plus color in dilution		.26

NEUTRAL OIL

200-3 color	.26½	.27
150-3 color	.22½	.23

PARAFFIN WAX

NEW YORK (prices per pound)—

123-125 a.m.p.		.04125
125-127 a.m.p.		.0425
128-130 a.m.p.		.0450
133-135 a.m.p.		.0525
135-137 a.m.p.		.0550
Crude scale:		
124-126 w.s.	.0260	.0270
124-126 y.s.	.0240	.0245

CRUDE OIL PRICES

Oklahoma, Kansas, North Central and East Central Texas

(January 9, 1936)

East Texas*	$1.15
Van, Tex.†	1.02
Altus and Tipton, Okla.‡	1.08
Other fields (see gravity table).	

*All companies. †Pure Oil Co. ‡Gypsy Oil Co.

West Texas

Crane, Upton, Howard, Glasscock and Mitchell Counties	$ .80
Winkler County	.85
Lea County, N. Mex.	.85
Pecos County*	.85
Pecos shallow†	.75

*Shell Petroleum Co., Gulf Pipe Line Co. and Humble Oil & Refining Co. †Shell Petroleum Corp.

Note—For Humble, Magnolia and Texas Co.'s West Texas and Lea County prices see gravity table. Above prices are those of other buyers.

Rocky Mountain States

(Effective January 9, 1936)

Iles, Colo., light*	$1.06
Iles, Colo., heavy*	1.00
Greybull, Wyo.*	1.28
Torchlight, Wyo.*	1.28
Grass Creek, Wyo., light*†	1.28
Grass Creek, Wyo., heavy*†	.72
Hamilton Dome, Wyo.*	.67
Elk Basin, Wyo., light *†	1.28
Frannie, Wyo., heavy*	.72
Frannie, Wyo., light (Feb. 24, 1936)*	.78
Hogback, N. Mex.*	1.21
Pondera, Mont.* (Jan. 29, 1936)	1.05
Salt Creek, Dutton Creek and Midway, Wyo., take Stanolind's Oklahoma prices on a gravity basis.	
Big Muddy, Wyo.†	1.11
Rock Creek, Wyo.†	1.12
Artesia, N. Mex. (Dec. 1, 1933)‡	.75
Maljamar, N. Mex. (Sept. 29, 1933)‡	.75
Fort Collins and Wellington, Colo.‡ (Jan. 9, 1936)	See Note
Florence, Colo.	.98
Lance Creek, Wyo.	.85
Lost Soldier, Wyo. (Sept. 30, 1933)	.38
Hudson, Wyo. (June 2, 1931)	.65
Sunburst, Mont.	1.35
Cat Creek, Mont.	1.28
Cut Bank, Mont. (May 23, 1934)	1.45

*Stanolind Oil & Gas Co. †Ohio Oil Co. ‡Continental Oil Co.

Note—Fort Collins and Wellington are not posted, price 5 cents under quotation of Salt Creek crude of like gravity (Fort Collins 36°; Wellington 33°). *Stanolind Oil & Gas Co. †Ohio Oil Co. ‡Continental Oil Co.

Southwest Texas

(January 9, 1936)

Saxet	$ .90
Mirando	.85
Pettus	1.25
Salt Flat*	.97
Salt Flat‡	.97
Darst Creek*	.97
Darst Creek†	.97
Luling	.90
Lytton Springs	1.00
Duval County	.85

*Humble Oil & Refining Co. †Magnolia Petroleum Co., Gulf Pipe Line Co. and Texas Co. ‡Shell Petroleum Corp. Saxet posted by Humble and Texas; Mirando by Humble and Magnolia; Pettus by Humble; Salt Flat by Humble; Luling and Lytton Springs by Magnolia; Duvall by Texas Co.

Middle Western States

OHIO OIL CO.

Lima (Jan. 10, 1936)	$1.25
Illinois (Jan. 9, 1936)	1.23
Princeton, Ind. (Jan. 9, 1936)	1.23
Midland, Mich. (Jan. 13, 1936)*	1.32
West Branch, Mich. (Jan. 14, 1936)	1.16
Muskegon, Mich.	1.00
Eastern Kentucky:	
Big Sandy River (Jan. 9, 1936)	1.30
Kentucky River (Jan. 9, 1936)	1.33
Western Kentucky (Jan. 9, 1936)	1.23

*Posted by Pure Oil Co. and Simrall Corp. and includes Greendale, Porter, Beaverton and Crystal crudes. West Branch, Mich., by Simrall Corp. Eastern Kentucky crude purchased by Ashland Refining Co., Ashland, Ky. Oceana posted by Old Dutch Refining Co. and Naph-Sol Refining Co.

Gulf Coast

(January 9, 1936)

Cleveland, Tex.	$1.10
Hardin, Tex.	1.03
Greta, Tex.	.90
Refugio, Tex., heavy	.90
Tomball, Tex.	1.30
LaFitte, La.	1.13
Livingston, Tex.	1.15
Bosco, La. (Jan. 16, 1936)	1.05
Evangeline, La.	1.07
Welsh, La.	.96

Cleveland and Hardin by Magnolia; Greta by Texas Co.; Refugio by Humble; Tomball by Humble and Magnolia; LaFitte by Texas Co.; Bosco by Pure; Evangeline and Welsh by Stanolind Oil & Gas Co.; Livingston by Shell Petroleum Corp.

North Louisiana and Arkansas

Smackover, all grades (Jan. 10, 1936)*	$ .75
Smackover, all grades (Jan. 9, 1936)†	.80
Tullos and Urania (Jan. 10, 1936)	.97
Nevada, Ark. (Jan. 10, 1936)	.65
El Dorado East Field (Jan. 16, 1936)	.75
Converse, Holly, Pleasant Hill and Zwolle (Jan. 10, 1936)*	1.10
Lisbon, Ark. (Jan. 10, 1936)*	1.10
Elm Grove, La. (Jan. 10, 1936)	.80

*Standard Oil Co. of Louisiana, Gulf Refining Co., Louisiana Oil Refining Co., Texas Co. (effective January 14) and Magnolia Petroleum Co. (effective January 16). Urania by H. L. Hunt Co. and Louisiana Oil Refining Co. Nevada by Standard of Louisiana. El Dorado East field by Magnolia Petroleum Co. Phillips Petroleum Co. (effective January 17), posts 75 cents for all grades in Union and Ouachita Counties, Arkansas.

Eastern States

TIDE WATER PIPE CO.
(Effective Jan. 13, 1936)

Bradford, Pa.	$2.45
Allegany, N. Y.	2.45

SOUTH PENN OIL CO.
(Effective Jan. 13, 1936)

Pennsylvania Grade Oil in National Transit Lines (Bradford field)	2.45
Pennsylvania Grade Oil in Southwest Pennsylvania Lines	2.17
Pennsylvania Grade Oil in Eureka Pipe Line lines	2.12
Pennsylvania Grade Oil in Buckeye Pipe Line lines	1.97
Corning Grade Oil in Buckeye Pipe Line Co.'s lines	1.42

PENNZOIL CO.
(Effective Jan. 13, 1936)

Pennsylvania Grade Oil in National Transit Lines:	
Group A — Includes Cochran, Franklin, Hamilton and Doolittle districts.	2.42
Group B — Includes Titusville district.	2.41
Group C — Includes Turkey and Tidioute districts.	2.40
Group D — Includes Bear Creek and Porkey districts.	2.39
Group E — Includes Eldeneau, Bull Creek, Rough Run, Carbon, Dipner, Bredlin, McJunkin, Jameson, Kenerdell, Emlenton, Tiona, Lacey and Kinzua districts.	2.36

Price depends on lengths of pipe line haul to plant at Oil City.

PURE OIL CO.
(Effective Jan. 13, 1936)

Cabin Creek, W. Va.	$2.12
Bradford Hollow, W. Va.	2.12
Kelly Creek, W. Va.	2.12

Canada

Ontario (Sept. 9, 1933):	
Petrolia*	$2.10
Oil Springs	2.17
Turner Valley (Feb. 3, 1936):†	
Clear naphtha	2.70
Discolored naphtha	2.46
Crude oil, 50 gravity	2.32
Crude oil, 45 to 49.9	2.12
Crude oil, 40 to 44.9	1.55

*Imperial Oil, Ltd. †Imperial Oil, Ltd., and Regal Oil & Refining Co.

Mexico

Panuco*	$ .82

*F.o.b. ship, based on February transactions and exclusive of production and export taxes and bar dues.

H. D. Patridge, director of purchases for Indian Territory Illuminating Oil Co., Bartlesville, Okla., presided at a meeting of national directors of the Purchasing Agents Association in the Southwest at Dallas, Tex., recently.

Crude Prices by Gravities

Gravity—	Oklahoma, Kansas, and Salt Creek, Wyo.	Central and North Texas	East Central Texas	North Louisiana, Arkansas	Gray County, Texas	Carson and Hutchinson Counties, Texas	Conroe, Texas	West Texas and Lea County, New Mexico	Gulf Coast, Texas and Louisiana	Anahuac and Dickinson, Texas	Iowa and Cameron Meadows, Texas
Below 20	....	....	....	....	....	....	....	....	$.92	....	$.82
20-20.9	....	....	....	....	....	....	....	....	.94	....	.84
21-21.9	....	....	....	....	....	....	....	....	.96	....	.86
22-22.9	....	....	....	....	....	....	....	....	.98	....	.88
23-23.9	....	....	....	....	....	....	....	....	1.00	....	.90
24-24.9	....	....	....	....	....	....	....	....	1.02	....	.92
Below 25	$.86	....	....	$.78	....	....	....	....	....	....	....
25-25.9	.88	....	....	.80	....	....	....	....	1.04	....	.94
26-26.9	.90	....	....	.82	....	....	....	....	1.06	....	.96
27-27.9	.92	....	....	.84	....	....	....	....	1.08	....	.98
28-28.9	.94	....	....	.86	....	....	....	....	1.10	....	1.00
Below 29	.94	$.84	$.81	....	....	....	....	$.75	....	....	....
29-29.9	.96	.86	.83	.88	....	....	....	.76	1.12	....	1.02
30-30.9	.98	.88	.85	.90	....	....	....	.78	1.14	$1.04	1.04
31-31.9	1.00	.90	.87	.93	....	....	....	.80	1.16	1.06	1.06
32-32.9	1.02	.92	.89	.94	....	....	....	.82	1.18	1.08	1.08
33-33.9	1.04	.94	1.01	.96	....	....	....	.84	1.20	1.10	1.10
34-34.9	1.06	.96	1.03	.98	....	....	....	.86	1.22	1.12	1.12
Below 35	....	....	....	....	$.86	$.81	....	....	....	....	....
35-35.9	1.08	.98	1.05	1.00	.88	.83	$1.24	.88	1.22	1.14	1.15
36-36.9	1.10	1.00	1.07	1.02	.90	.85	1.26	.90	1.22	1.16	1.12
37-37.9	1.12	1.02	1.09	1.04	.92	.87	1.28	.90	1.22	1.18	1.12
38-38.9	1.14	1.04	1.11	1.06	.94	.89	1.30	.90	1.22	1.20	1.12
39-39.9	1.16	1.06	1.13	1.08	.96	.91	1.32	.90	1.22	1.22	1.12
40 and over	1.18	1.08	1.15	1.10	.98	.93	1.34	.90	1.22	1.24	1.12

Magnolia Petroleum Co. in the East Central Texas field pays 7 cents per barrel less than above posted prices in that field.

STANDARD OIL CO. OF CALIFORNIA

Crude oil prices at the well effective March 7, 1936

Gravity—	Signal Hill (Long Beach)	Seal Beach	Alamitos Heights	Huntington Beach	Inglewood	Playa del Rey	Olinda-Brea Canon	Athens-Rosecrans	Dominguez	Elwood Terrace	Torrance	Richfield	Whittier East Coyote (La Habra)	Montebello	West Coyote Hills	Santa Fe Springs	Mountain View	Elk Hills	Buena Vista Hills Midway-Sunset except Lakeview Area	Lakeview Area	Lost Hills	Coalinga	Wheeler Ridge	Kettleman Hills
14-14.9	$.80	$.79	$.74	$.78	$.79	$.80	$.76	....	....	....	$.80	$.76	$.76	$.77	$.78	....	....	$.65	$.70	$.65	$.70	$.70	....	....
15-15.9	.80	.79	.74	.78	.79	.80	.76	....	....	....	.80	.76	.76	.77	.78	....	....	.65	.70	.65	.70	.70	....	....
16-16.9	.80	.79	.74	.78	.79	.80	.76	....	....	....	.80	.76	.76	.77	.78	....	....	.65	.70	.65	.70	.70	....	....
17-17.9	.80	.79	.74	.78	.81	.80	.76	....	....	....	.80	.76	.76	.77	.78	....	....	.65	.70	.65	.70	.70	....	....
18-18.9	.80	.79	.74	.78	.84	.80	.78	....	....	....	.82	.76	.76	.77	.78	....	....	.65	.70	.65	.70	.70	....	....
19-19.9	.82	.79	.74	.82	.87	.84	.81	....	....	....	.85	.76	.78	.77	.78	....	$.70	.66	.74	.66	.74	.71	$.70	....
20-20.9	.85	.79	.74	.85	.90	.88	.84	....	....	....	.88	.78	.82	.77	.80	....	.70	.68	.78	.68	.78	.72	.70	....
21-21.9	.88	.79	.74	.89	.93	.92	.88	....	....	....	.91	.80	.85	.77	.84	$.78	.73	.71	.82	.71	.82	.74	.70	....
22-22.9	.92	.82	.74	.92	.96	.96	.92	....	....	....	.93	.84	.89	.79	.88	.78	.77	.74	.87	.74	.86	.76	.72	....
23-23.9	.95	.86	.77	.96	.99	1.02	.96	$.84	$.79	....	.96	.88	.93	.83	.92	.78	.80	.77	.92	.77	.90	.83	.76	....
24-24.9	.99	.91	.80	1.00	1.02	1.06	.99	.88	.81	....	.99	.91	.96	.85	.96	.82	.84	.80	.97	.80	.94	.86	.79	....
25-25.9	1.03	.96	.82	1.03	1.05	1.11	1.03	.93	.83	....	1.02	.95	....	.89	.99	.86	.88	.83	1.01	.83	.98	.90	.83	....
26-26.9	1.06	1.00	.85	1.07	1.09	1.16	1.06	.98	.86	....	1.05	.98	....	.93	1.03	.90	.91	.86	1.06	.86	1.02	....	....	....
27-27.9	1.10	1.06	.88	1.11	1.13	....	1.10	1.03	.88	....	1.07	....	....	.96	1.06	.95	.95	.88	1.10	.88	1.06	....	....	....
28-28.9	1.13	1.10	.90	1.14	1.15	....	1.14	1.07	.90	....	....	1.06	....	.99	1.10	.99	.99	.91	1.15	.91	1.10	....	....	....
29-29.9	1.17	1.15	.93	1.18	1.18	F.O.B.	1.17	1.12	.93	....	....	1.09	....	1.03	1.14	1.03	1.02	.94	1.20	.94	1.14	....	....	....
30-30.9	1.21	1.19	.96	1.22	1.21	our	1.21	1.17	.95	F.O.B.	....	....	....	1.07	1.17	1.08	1.06	.97	1.25	.97	1.18	....	....	....
31-31.9	....	....	....	....	1.24	Pipe	1.24	1.22	.97	Ship	....	....	....	1.11	1.21	1.12	1.09	.99	1.29	.99	....	....	....	....
32-32.9	....	....	....	....	1.27	Line	1.27	1.27	1.00	....	....	....	....	1.14	1.25	1.16	1.13	1.02	1.34	1.02	....	....	....	....
33-33.9	....	....	....	....	....	....	....	1.33	....	$1.28	....	....	....	1.18	1.28	1.20	1.17	1.04	1.38	1.04	....	....	....	$1.19
34-34.9	....	....	....	....	....	....	....	1.37	....	1.32	....	....	....	1.22	1.32	1.25	1.20	....	....	....	....	....	....	1.23
35-35.9	....	....	....	....	....	....	....	1.42	....	1.36	....	....	....	1.25	....	1.29	....	....	....	....	....	....	....	1.27
36-36.9	....	....	....	....	....	....	....	1.46	....	1.39	....	....	....	1.29	....	1.33	....	....	....	....	....	....	....	1.31
37-37.9	....	....	....	....	....	....	....	1.51	....	1.43	....	....	....	1.32	....	1.37	....	....	....	....	....	....	....	1.36
38-38.9	....	....	....	....	....	....	....	1.56	....	....	....	....	....	1.36	....	1.42	....	....	....	....	....	....	....	1.39
39-39.9	....	....	....	....	....	....	....	1.61	....	....	....	....	....	1.40	....	....	....	....	....	....	....	....	....	1.43
40-40.9	....	....	....	....	....	....	....	1.66	....	....	....	....	....	1.43	....	....	....	....	....	....	....	....	....	....

Newhall, McKittrick, Kern River and Round Mountain 70 cents for all grades. Kern Front 70 cents for all grades.

Market Record of Active Oil Stocks Listed on New York Stock Exchange

Compiled by Carl H. Pforzheimer Co., 25 Broad Street, New York City, Members New York Stock Exchange and New York Curb Exchange

1936 High	1936 Low	Week ended May 9 Sales	High	Low	Close	Stocks—	Total shares outstanding	Par value	Dividend rate	Payable or last paid	Dividends paid in 1935	1935 High	1935 Low	1934 High	1934 Low
125½	75	2,000	100⅛	95	96¼	Amerada Corp.	788,675	N.P.	50cQ	4-30-36	$2.00	80	48½	55⅝	39
35⅛	27⅛	15,900	30¼	28	29	Atlantic Refining	2,664,904	$25	25cQ	6-15-36	1.00	28	20½	35¼	21½
20	14⅛	25,600	18⅝	16½	17⅝	Barnsdall Corp.	2,131,090	$5	15cQ†	5-1-36	‡.20	14¾	5⅞	10	5⅞
21⅝	14	40,100	18⅛	16⅜	17¼	Columbia Gas & Elec.	11,610,036	N.P.	20c	5-15-36	.20	15¾	3⅜	19¼	6⅝
15¼	11½	28,700	12⅜	11⅜	12⅛	Consolidated Oil Corp.	13,983,287	N.P.	25c	4-7-36	.25	12¼	6½	14⅛	7⅛
38½	29⅛	11,000	33	31	32½	Continental Oil of Delaware	4,682,671	$5	25c	4-30-36	.62½	35	15½	22¾	15⅝
34¾	22	3,600	25⅝	24	24¾	General Asphalt	387,149	$10	25c	12-17-35	.25	22½	11¾	23½	12
12¼	6⅜	19,100	9⅝	8	9	Houston Oil (new)	1,098,618	$25	....	10-17-30	....	7	1½	5⅝	2½
23	17¼	8,400	20¾	19⅜	20¾	Mid-Continent Petroleum	1,843,872	$10	40cSA	6-1-36	.40	20½	9½	14⅜	9⅛
40	19⅞	4,200	34¼	31½	33¼	National Supply of Delaware	382,591	$25	....	5-15-31	....	20⅞	9	21⅛	10
17½	12½	27,100	13¾	12⅝	13¾	Ohio Oil Co.	6,563,377	N.P.	25cSA	6-15-36	.30	14¼	9¼	15⅛	8½
18	11¾	3,600	13⅝	12½	13⅝	Pacific Western Oil	1,000,000	N.P.	40c	11-30-34	.25	14	6¾	9⅝	5½
4¼	1⅝	1,100	3¼	2⅞	3	Panhandle P. & R.	198,770	N.P.	....	.....	....	1⅞	½	2½	⅝
49⅜	38⅛	18,700	43⅞	40½	42¾	Phillips Petroleum	4,152,836	N.P.	50cQ¶	6-1-36	1.25	40	13¾	20⅜	13⅜
16½	11⅞	4,000	14½	13⅜	14¼	Plymouth Oil Co.	1,050,000	$5	25c	3-30-35	.25	13	6½	16¾	7⅛
24⅞	16⅝	42,600	20¼	17¾	18⅞	Pure Oil Co.	3,038,370	N.P.	....	9-1-30	....	17	5⅞	14⅞	6⅛
57⅝	48⅜	1,400	57⅝	57	57	Royal Dutch N. Y. shares	fl. 503,642,000	fl. 100	$1.70	8-1-35	1.70	48½	29½	39⅛	28⅝
43⅝	32¼	2,000	35⅜	33¼	34	Seaboard Oil of Delaware	1,244,283	N.P.	25cQ	6-15-36	1.00	36⅞	20⅜	38⅜	20⅜
19¼	14¾	21,600	17⅞	15	17¾	Shell Union Oil	13,070,625	N.P.	....	6-30-30	....	16½	5⅛	11½	6
120	110½	1,300	116	114	116	Shell Union Oil pfd.	400,000	$100	....	7-1-31	....	111	63½	89	57
6¾	4⅝	3,900	4¾	4⅝	4¾	Simms Petroleum	461,698	$10	1.00 liq.	1-27-36	11.75 liq.	18¾	4¾	17⅛	7¼
31½	19½	1,600	25⅜	23	23½	Skelly Oil	1,008,514	$15	....	12-15-30	....	20½	6½	11½	6
17	13	50,800	13½	13	13	Socony-Vacuum	31,151,075	$15	20cSA	3-16-36	.30	15¾	10⅝	19⅞	12⅛
47⅝	37	15,100	39½	37	38½	Standard Oil of California	13,014,754	N.P.	25cQ†	6-15-36	1.00	41⅛	27⅝	42⅞	26⅛
40⅛	32¾	24,900	36⅝	34	35¼	Standard Oil (Indiana)	15,215,677	$25	25cQ†	6-15-36	1.00	33⅜	23	32¾	23¼
30	25	200	25	25	25	Standard Oil of Kansas	200,000	$10	50cQ	10-31-34	....	32	20	41	26
70	51⅛	33,200	60½	57⅜	59¼	Standard Oil of New Jersey	25,856,081	$25	75cSA¶	6-15-36	‖1.25	52⅜	35¾	50⅛	39¼
91	72	300	80	78	78	Sun Oil	1,733,013	N.P.	25cQ	6-15-36	$1 & 7% Stk.	77	60½	74¼	51⅛
39½	28⅞	14,800	35¼	33⅝	33⅞	Texas Corp.	9,340,069	$25	25cQ	4-1-36	1.00	30¼	16½	29⅜	19⅝
15¼	7½	6,100	10¼	9½	10¼	Texas Pacific Coal & Oil	880,703	$10	....	12-31-29	....	9¼	3¼	6½	2½
19⅛	14⅜	7,900	17	16	16½	Tide Water Associated	5,642,342	N.P.	15cQ	6-1-36	....	15⅞	7⅝	14⅜	8
106½	100⅝	1,700	104⅞	103½	104⅞	Tide Water Associated pfd.	626,221	$100	$1.50Q	4-1-36	$6.50	104½	84	87	64½
28½	20⅞	4,700	24	22¾	22¾	Union Oil of California	4,386,070	$25	25cQ	5-9-36	1.00	24	14¾	20½	11⅛
31⅝	22⅝	400	24⅞	24¼	24⅝	Union Tank Car Co.	1,200,000	N.P.	30cQ	6-1-36	1.20	26½	20⅞	25¾	15⅝
5¼	2¾	4,900	4¾	3¾	4¾	Wilcox Oil & Gas	424,839	$5	....	5-10-28	....	3⅛	1	5¾	2

*Ex-dividend. †Plus extras. ‡Also 50 per cent in stock of Barnsdall Ref. §Partly on account of accumulation. ‖Dividend 4/75 Mission Corp. paid 3-15-35. ¶Includes extras.

Market Record of Active Oil Stocks Listed on New York Curb

Compiled by Carl H. Pforzheimer Co., 25 Broad Street, New York City, Members New York Stock Exchange and New York Curb Exchange

1936 High	1936 Low	Week ended May 9 Sales	High	Low	Close	Stocks—	Total shares outstanding	Par value	Dividend rate	Payable or last paid	Dividends paid in 1935	1935 High	1935 Low	1934 High	1934 Low
20¼	13¼	3,300	17½	15⅝	16	Bridgeport Machine Co.	150,000	N.P.	....	5-1-30	....	14⅛	3⅜	3⅝	⅛
50	39¾	100	41	41	41	Buckeye Pipe Line Co.	200,000	$50	75cQ	6-15-36	$3.00	42½	30½	38	26
4⅞	2½	9,300	4⅛	3¾	3⅞	Carib Syndicate	799,020	25c	....	.....	....	4¼	1⅝	5½	1⅛
124¾	110	200	110	110	110	Chesebrough Mfg. Co.	120,000	$25	$1Q†	3-31-36	6.50	157	115	150	116
7⅝	3	36,100	4⅞	4½	4½	Cities Service	37,804,394	N.P.	....	6-1-32	....	3¼	⅜	4¼	1⅜
4	1⅛	2,200	2½	2¼	2⅜	Colon Oil	2,200,000	N.P.	....	.....	....	2⅛	⅛	3¼	⅛
4⅛	1½	2,800	2⅝	2¼	2⅜	Cosden Oil	399,687	$1	....	.....	....	1½	¼	3⅞	⅛
34¾	19⅞	8,500	28⅜	26½	28	Creole Petroleum	6,974,356	$5	20c	12-31-35	.20	23¾	10	14⅜	9⅝
12	9	200	10¾	10⅝	10⅝	Darby Petroleum	509,696	$5	25cSA	1-15-36	.50	8⅞	4	7½	4⅛
4⅝	1⅞	400	3½	3⅜	3⅜	Derby Oil & Refining	263,162	N.P.	....	.....	....	2	⅝	2¼	1
44	39	50	39	39	39	Eureka Pipe Line	50,000	$50	$1Q	5-1-36	4.00	38	33½	37	30
98	72	5,900	86⅜	82	83½	Gulf Oil Corp.	4,538,101	$25	25c	4-1-36	....	74¾	50¼	76¾	49¾
76½	61⅜	4,500	63	61⅜	61⅝	Humble Oil & Refining (new)	8,923,935	N.P.	25cQ	4-1-36	1.25	64	44	49½	33¼
24½	20	16,400	22½	20⅞	21⅜	Imperial Oil of Canada	26,919,871	N.P.	62½cSA†‡	12-2-35	1.25	22½	15⅝	17⅞	12⅝
9¼	5½	400	6⅞	6⅝	6⅜	Indiana Pipe Line	300,000	$10	20cSA	5-15-36	.35	6½	3⅝	6⅞	2⅝
39⅝	33½	11,500	38⅞	36¼	37½	International Petroleum	14,247,088	N.P.	$1.25†‡	12-2-35	2.50	39¾	28	33⅜	19⅝
15⅜	9⅞	43,800	15⅜	12¾	14⅛	Louisiana Land & Exp.	3,000,000	N.P.	10cQ	3-16-36	.10	11⅜	4⅜	5	2⅛
15	7⅜	1,200	12	11⅜	11⅞	Lion Oil Refining	270,000	N.P.	....	10-27-30	....	8¼	3½	6	3⅜
14¼	9⅞	2,200	12	11¼	11⅜	Lone Star Gas	5,382,723	N.P.	20cSA	2-15-36	.30	10⅞	4½	8⅜	4¼
8⅜	5	2,000	5⅞	5½	5⅞	Mountain Producers	1,682,182	$10	30cSA	12-31-35	.90	5¾	4⅛	5½	4
23	18⅝	5,500	19¼	18½	18⅞	National Fuel Gas	3,810,183	N.P.	25cQ	4-15-36	1.25	20	11¾	18⅛	13⅛
15⅜	10	1,100	11¼	10½	11	National Transit	509,000	$12.50	40cSA	6-15-36	.75	10⅝	6¾	9½	7
4½	2⅞	300	3	3	3	New Bradford Oil	1,445,202	$5	10cSA	5-15-36	.20	3¼	2	2½	1⅝
6⅝	1⅝	400	3⅜	3⅝	3⅝	New Mexico and Arizona	1,000,000	$1	....	.....	....	2½	1	2¾	1
6¼	4½	100	5	5	5	New York Transit	100,000	$5	15cSA	4-15-36	.30	4⅞	3	4¾	3
9¼	6¼	400	6¾	6¼	6¼	Northern Pipe Line	120,000	$10	25cSA	2-2-36	.50	8	5¼	7	4⅝
6⅝	3¼	61,800	6⅝	5¾	5¾	Pantepec Oil	1,608,700	N.P.	....	.....	....	4⅜	1¼	2⅝	⅞
19¼	4½	8,400	16	14⅜	16	Root Petroleum Co.	336,045	$1	....	.....	....	5	1½	....	....
4¾	1⅞	1,500	3¾	3	3¾	Ryan Consolidated	296,931	N.P.	....	.....	....	2½	⅝	3⅜	⅞
10	7	1,000	7½	7¼	7¼	Salt Creek Producers	1,496,859	$10	40cSA	12-31-35	1.20	7½	5½	7⅞	5⅛
40½	32½	1,600	35⅞	35	35	South Penn Oil	1,200,000	$25	50c†	3-31-36	1.35	34½	21⅝	26½	17½
7⅞	4⅜	100	5¼	5¼	5¼	Southern Pipe Line	100,000	$10	15cSA	3-2-36	.30	5	3⅞	5½	3½
56	54	No sales	..	..	..	Southwest Penna. Pipe Lines	35,000	$50	$1Q	4-1-36	5.00	56	44¼	47	41
23⅝	17⅛	2,600	17⅝	17¼	17½	Standard Oil of Kentucky	2,604,790	$10	25cQ	3-16-36	1.25	24	18	18⅜	14⅝
14⅝	11½	400	12⅛	12	12	Standard Oil of Nebraska	188,403	$25	....	6-20-34	....	12	7¾	16⅞	8¼
36¼	21⅜	3,200	30	28¾	29⅝	Standard Oil of Ohio	753,740	$25	....	1-3-33	....	23⅝	11½	28½	12¼
5	2⅝	18,500	4¾	4½	4⅝	Sunray Oil	1,610,810	$1	....	4-15-31	....	2⅞	⅞	2	⅛
9¾	6	900	6½	6⅛	6¼	Texon Oil & Land	336,028	N.P.	15cQ	3-31-36	.60	6⅞	5	11	4⅝
7½	4⅜	12,100	5⅝	4½	5⅜	Texas Gulf Producing Co.	888,076	N.P.	....	12-29-34	....	4¾	2½	7	3⅝

*Ex-dividend. †Includes extras. ‡Payable in Canadian funds.

Note.—In comparing highs and lows for the several years in the two tables, it will be necessary to take into consideration cases where there have been stock split-ups.

CLASSIFIED ADVERTISING

Royalties—Production

Brokers—Salesmen

Sell in the most active area in the United States — The Permian Basin of West Texas and Southeastern New Mexico. From the standpoint of royalty investors this area has much to offer. Can supply you with choice non-producing royalties located on geophysical highs. Also drilling blocks, close in acreage to production, or wildcat leases. I maintain my own field men who cover this area for me. All offerings meet the requirements of the Securities and Exchange Commission. Inquiries invited.

B. D. BUCKLEY

Paul Brown Bldg., St. Louis, Mo.

ROYALTIES and leases in all fields, producing and nonproducing, Kans., Okla., Tex. Get my list before buying. JAMES R. HAYNES, Grantville, Kans.

MONTHLY PAYING ROYALTIES on which we have filed SCHEDULES A with the SEC at WASHINGTON. Quoted Dealers Exclusively.
W. E. COOK
Suite 812, Palace Bldg., Tulsa, Okla.

Producing-ROYALTIES-Non-Producing Dealers Exclusively
Schedules and Engineers reports furnished
G. D. TERRIEN
412-13 Central Bank Bldg., Tulsa, Okla.

HIGH GRADE producing oil and gas royalties offered to dealers. Billie Smallwood, P. O. Box 2261, Tulsa, Oklahoma.

OIL PRODUCTION, Royalties, Leases, Land and estimating their values, has been my work for the past 30 years, with headquarters here, but covering parts of Oklahoma and New Mexico, States of many opportunities. I offer my services and experience to investors in these lines. E. B. Reeves, Box 13, Alanreed, Gray County, Texas, or Box 475, McLean, Texas.

ACREAGE for deep tests, shallow oil field Anderson County, Kansas. W. L. Morris Loan Co., Garnett, Kansas.

F. A. SANSOME
Trustee for First and Second Dependable Oil Corps.
MAINTAINS MARKET FOR DEALERS
Over $2,000,000 in producing oil royalties on hand at all times
522 Fifth Ave. New York, N. Y.

SHERIDAN and GOVE Cos., Kansas drlg. blks. Royalties, Leases, Low Prices. Mutual Oil Enterprise, Oakley, Kansas.

Producing and Non-Producing Royalties. Bosco, Van, Rodessa, West Texas.
Wholesale — Retail.
W. E. HOUSEL
76 Beaver Street, New York City.

ANDREW J. BARRETT
The Philtower
Tulsa, Oklahoma.

PRODUCING OIL ROYALTIES
Bought (Wholesale) Sold.
Inquiries invited from Oil Companies, Bankers, Dealers.
JOHN J. KOEHLER
20 Broad St. New York

PRODUCING OIL ROYALTIES
for dealers.
H. P. BOWEN
842 Kennedy Bldg., Tulsa, Okla.

VAN POOL — EAST TEXAS
Bought — Sold — Wholesale.
W. R. Brown & Co., Inc.
14 Prospect Pl., East Orange, N. J.

Van—East Texas—Louisiana Royalties
Bought—Sold.
WILLIAM MONROE LAYTON
67 Wall St., Suite 1510, New York City.

Royalties—Production

I BUY AND SELL oil royalties and producing wells, East Texas field. B. A. SKIPPER, Longview, Texas.

PRODUCING OIL ROYALTIES
(ALL FIELDS)
Bought, Sold and Quoted.
HENRY L. BAKER CO.
715 Van Nuys Bldg.,
Los Angeles, Calif.
Telephone Trinity 7391

Situations Wanted

Petroleum Refiner and Chemist, 10 yrs. complete plant experience with major companies. Technical training at O. U. Address P. O. Box 718, Okla. City.

GRAD. ENGR.—Seven years experience as Manager of Gas and Electric properties, additional experience testing Positive and Orifice meters, appraisal of gas properties, leakage surveys, wants position with gas or oil company. Address Box H-261, The Oil and Gas Journal, Tulsa, Oklahoma.

OFFICE MAN—15 years oil experience in accounting and land and lease records. Legal education. Desires connection with independent producer or Land-Tax Departments of producing company. Single, 36, reliable. Go anywhere.
ADDRESS BOX H-270
The Oil and Gas Journal, Tulsa, Okla.

Business Opportunities

GEOLOGIST desires connection on percentage basis plus expenses. Highest credentials. Address Box G-823, The Oil and Gas Journal, 415 Lexington Avenue, New York City.

WANTED—Responsible party's help in development of 200-acre lease, West Branch, Mich. field. Proven territory. Offset well to drill. Straight ⅛th royalty. Best investment in State. Good proposition to right party.
Address Box 215, Alma, Mich.

Incorporations

DELAWARE CHARTERS: Complete incorporating and organizing service $35. Submitted forms. Chas. G. Guyer, Inc., Wilmington, Delaware.

CHARTERS — Delaware best, quickest, cheapest, most liberal. Free forms. Colonial Charter Co., Wilmington, Del.

Oil Industry Printing

OIL FIELD LEGAL BLANKS
Leases, assignments, releases, township plat books, well records, etc. Request on your letterhead gets free catalog. Olds Press, 215 East Third St., Tulsa, Okla.

Leases Production

DRILLING BLOCK — 8,000 acres fee, and you take permit, making solid block, near Casper, P. O. Box 1162, Casper, Wyo.

---

320 A. in Butler Co., Pa., will lease for oil or coal, 1,000 ft. to oil; 7-ft. vein of coal; drift mining. J. W. BOUSE, 100½ W. Grand, Oklahoma City, Okla.

OIL OR NO PAY
Oil located. Depth and quantity guaranteed with automatic photo-magnetometer. Guaranteed producers drilled.
HERRICK
1213 Cedar Ave., Long Beach, Calif.

WILL SELL HALF OF FEE interest in 80.94 acres at Lane City, Texas, for Five Thousand Dollars, or will sell one-fourth fee interest for Twenty-five Hundred. This land is under lease by a Major; and well located in their block.
ADDRESS OWNER
at P. O. Box 548, Wharton, Texas

EASTERN COLORADO—Have limited supply of oil and gas leases located in Cheyenne, Kit Carson and Yuma Counties. These leases are well located. Just think of twenty-year paid up lease for $2.50 per acre. Also have some well located royalty (non-participating) for $2.50 per acre. Can assemble a block to responsible parties in Kansas or Eastern Colorado. After the 20th of May address me at my Tulsa office, 217 West Fifth St., Tulsa, Okla. Until the 20th of May address will be New Hotel, Goodland, Kansas. W. D. McCOY.

INVESTIGATE—Leases $3 acre near new field and $1,000 acre. Not get rich quick but active drilling makes good profits possible. E. M. ADAMS, Clarksville, Texas.

SHELBY COUNTY at last has a producing well. Several tests now going down. This County has been worked out and approved by best geologists. Have 1,000 acres on structure for drilling contract. Small bonus. C. A. Parker, Box 451, Center, Texas.

SAN JUAN Basin, New Mexico, Offering 320 acres top of structure including Midwest Discovery well, high gravity oil 1,000 feet; wonderful deal for developer or promoter.
Roy G. Barton, Box 191, Clovis, N. Mex.

OFFERING very cheap, fee and all royalty, possible oil and gas bearing territory, 20-40-80 and 160-acre tracts in Oklahoma. Billie Smallwood, P. O. Box 2261, Tulsa, Oklahoma.

Leases—Production

NEW MEXICO—My weekly scout report furnishes complete and reliable information on New Mexico developments. Send for copy. W. S. Patterson, Santa Fe, New Mexico.

NEW MEXICO Oil and Gas Leases and Royalties. Also inquiries and listings wanted. F. R. WARN, Santa Fe, New Mexico.

ECTOR COUNTY Drilling Block: 960 acres short distance northwest Goldsmith pool. Sound reasons for heavy production. Wire H. B. Opp, Burnet, Texas.

LANDS, Leases, Royalties, anywhere, bought, sold. Lands, $2 acre, up. Leases 25c acre, up. Advise needs. American Investment Co., Houston, Texas.

SCOUT reports furnished on any Panhandle Oil Property, with my ideas of values, etc. Price $5.00 and up. Scouting in New Mexico and Oklahoma after May the 15th. E. B. Reeves, Box 475, McLean, Tex.

10-ACRE LEASE for sale at prevailing prices, one quarter mile from C. A. Parker's discovery well Shelby County, Tex. J. D. Taylor, DeSoto Hotel, New Orleans, La.

FOR LEASE — By owner, oil land close to production. Lot 2 and E½ of Lot 3, Sec. 5-15-15. Miss Bessie Welch, 546 S. 2nd St., Muskogee, Okla.

10,000 Acre Lease for Sale—5-year paid up in Schleicher County, Texas. Big drilling campaign just getting under way, one 12,000,000 foot gasser completed, two wells now drilling, two more to start soon. Address H. B. Opp, Burnet, Tex.

DRILLING BLOCK Young County, Texas, 100 acres top of structure; 750 ft. first oil sand; 40 gravity oil; cheap drilling near producing wells.
Roy G. Barton, Box 191, Clovis, N. Mex.

9,000-ACRE oil lease for sale, located south of Sea-Boards 12,000,000-ft. gasser in Hamilton County. H. B. Opp, Burnet, Texas.

Drilling Block—3,000 acres in Texas Permian Basin. On line between two shallow pools; Humble holds two large blocks in close proximity. Address H. B. Opp, Burnet, Texas.

Ranches and Farm Lands

1430 ACRE PLANTATION IN RED RIVER VALLEY ADJOINING NEW CHEYNEVILLE OIL FIELD

This plantation is located between Cheyneville and Bunkie, La., on concrete Highway No. 71. Improved with beautiful colonial residence, set in grove of magnificent trees. It is traversed by Bayou Bouef giving perfect natural drainage. Very fertile type of Red River land that makes bale of cotton per acre, finest potato and sugar cane land. Within two miles of sugar mill.

The plantation is located only 1½ miles from new proven Cheyneville oil field where they have recently brought in many new producing wells and only one dry hole. The field is not on a salt dome and it is predicted that this plantation will be in direct line of production. Adjoining farm was leased at $35 per acre for oil and gas rights. Land within one mile has brought $100 per acre for royalty rights. Neither lease nor royalties have been sold on this farm.

Place belongs to large Insurance Company and they will either sell place as a whole, make oil lease or sell royalty. Land with 1/16th oil reservation can be sold on attractive terms at $50 an acre.

Also 100 other farms and plantations in Louisiana for sale.

THE NEELY BOWEN COMPANY
67 Madison Avenue, Memphis, Tennessee.

For Sale—Maps

Oilfield and County Ownership Maps. New price list on request. Send $1.00 for map of Texas and eastern New Mexico.
ZINGERY OIL MAP CO.
Fair Bldg. Fort Worth, Texas

SECTIONIZED map of West Texas and Southeast New Mexico. 46 x 50. 35 counties. Shows oil development, $3.00. Oil City Map Co., Fort Worth, Texas.

CLASSIFIED DISPLAY RATES

Classified Display is set with a border and may be used in one or two column sizes.

1 Inch	*1 time*	*$5.00*
1 Inch	*13 times*	*4.50 per inch*
1 Inch	*26 times*	*4.00 per inch*
1 Inch	*52 times*	*3.50 per inch*

This space may be contracted for over a period of one year from the date of the first insertion and is PAYABLE IN ADVANCE, MONTHLY

CLASSIFIED RATES

Classified advertising rates: First insertion, 35 cents a line; each additional insertion, 25 cents a line, PAYABLE IN ADVANCE. Six words usually make a line. Count as a word each one-letter word and each group of figures. White space computed at regular line rate. Allow two extra lines for blind ads. Ads of less than three lines not accepted. No formal acknowledgment is made, and proofs cannot be shown in advance of publication.

	1 time	2 times	3 times	4 times		1 time	2 times	3 times	4 times
3 Lines	*$1.05*	*$1.80*	*$2.25*	*$3.30*	*7 Lines*	*$2.45*	*$4.20*	*$5.95*	*$7.70*
4 Lines	*1.40*	*2.40*	*3.40*	*4.40*	*8 Lines*	*2.80*	*4.80*	*6.80*	*8.80*
5 Lines	*1.75*	*3.00*	*4.25*	*5.50*	*9 Lines*	*3.15*	*5.40*	*7.65*	*9.90*
6 Lines	*2.10*	*3.60*	*5.10*	*6.60*	*10 Lines*	*3.50*	*6.00*	*8.50*	*11.00*

We reserve the right to withhold all advertising of questionable character. To avoid delay be sure to send remittance with copy. We will set your ad in the smallest amount of space possible and refund all overpayments. One-time insertions will not be run until fully paid. Forms close MONDAY NOON before each issue date.

THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

Special Offering of Pumps

We are offering a miscellaneous assortment of pumps which have accumulated in our stocks recently and will be sold at bargain prices for quick sale.

1—Pacific Horizontal Split Shell Centrifugal Hot Oil Pump, Size 2", capacity 215 GPM, 230 ft. hd. at 3600 RPM, double suction, water cooled jackets, steel fluid ends, type D.H.T.B. direct connected to 20 H.P., 440/220 volt, 60 cycle, 3 phase, explosion proof enclosed case, Louis-Allis 3600 RPM electric motor.

2—Pacific 8-stage solid shell pumps minimum capacity 80 bbls. per hour, 350-lb. pressure to maximum capacity 420 bbls. per hour 1000-lb. pressure, capacities calculated at 3600 RPM.

1—Byron Jackson Horizontal Split Shell Centrifugal Pump, 3x15, 4-stage Multiplex, capacity 420 GPM, 1000 ft. hd. at 1800 RPM, direct connected to 200 H.P. General Electric, type KTP, 440 volt 60 cycle, 3 phase, 1800 RPM, induction motor complete with manual control compensator, type C.R. 1034.

1—Worthington Centrifugal Pump size 5", capacity 715 GPM, 98 ft. hd. at 1160 RPM, 8" suction, direct connected to 30 H.P. General Electric type KT, 2200 volt, 3 phase, 60 cycle, 1160 RPM induction motor.

1—Worthington Duplex (piston type) Pump, size 10x12, 8" suction, 6" discharge, Serial No. 280029 direct connected to General Electric Induction Motor 25/12.5 H.P., type KT 526, 440 volts.

1—Kinney Rotary Pump, 1½" suction, 1½" discharge, 60 GPM at 1200 RPM, mounted on common base with General Electric Induction Motor, 1½ H.P., 1200 RPM, type KT 926, 440/220 volt, 60 cycle, 3 phase, No. 4719140.

1—Blackmar Rotary Pump, 6" suction, 6" discharge mounted on common base with explosion proof Louis-Allis 50 H.P., 860 RPM, type F, frame No. 505, 440/220 volt, 60 cycle, 3 phase, No. 166285 Electric Motor. Complete unit mounted on steel skids (sled type).

1—Blackmar Rotary Pump, 4" suction, 4" discharge mounted on common base with General Electric squirrel cage induction motor, 15 H.P. 900 RPM, type KT 312, 440/220 volt, 60 cycle, 3 phase, No. 2296120 electric motor. Complete unit mounted on steel skids (sled type).

EXCEPTIONAL OFFER OF KEY RETURN BEND FITTINGS

325—3½" O.D. x 8" center, plain box type return bends with projecting ear lugs to retain holding members.

BROWN-STRAUSS CORPORATION

Main Office—1446 Guinotte Ave., Kansas City, Mo.

Branches

Sapulpa, Okla. Arkansas City, Kans. Pyote, Texas

Steel Storage Tanks

We will erect latest type 55,000 bbl. all steel storage tanks at a great saving.

Over 500 tanks on hands from 500 bbls. to 80,000 bbls. Ready for delivery.

50—55,000 Bbl. tanks now being cut down, Haynesville, La. Will sell complete tanks or sheets. 5,000 squares of 2½-ft. x 8-ft. flat 22 gauge galvanized sheets ready for delivery, Haynesville, La.

Wire—Phone—Write—W. C. Berry

SONKEN-GALAMBA CORPORATION

64 North Second Street Kansas City, Kansas.

REFINERY EQUIPMENT COMPLETELY RECONDITIONED

2—10' x 18' x 2⅜" steel, Vogt Reaction chambers, $750 each on car, Ardmore, Okla.

Gasoline, Run Down and Pressure Tanks.

Pumps, all kinds and sizes, condenser boxes, agitators, pipe stills, everything needed for refinery requirements. Complete line of valves and fittings, Oakite treated and tested.

W. C. Berry Wire—Phone—Write H. J. Galamba

SONKEN-GALAMBA CORPORATION

64 North Second St. Kansas City, Kansas

STEEL SHEETS

3/16" to ½" thicknesses in 5' x 10' or 5' x 15' sizes, guaranteed like new, any quantity for immediate shipment, 60,000 tons on hand.

WELDED STOCK TANKS

Extra Heavy, any size, delivery Kansas City, Tulsa, Shreveport, Dallas, Houston, Wichita. Wire, write or phone

THE TANK CORPORATION

64 North Second St., Kansas City, Kan. | Mayo Hotel, Room J, Tulsa, Oklahoma | P. O. Box 868, Cincinnati, Ohio

FOR SALE
CASINGHEAD GASOLINE PLANT

Capacity 8,000,000 Cu. Ft. Per Day
—10,000 Gallons—

Plant erected new by Atlantic Oil Producing Co. at Pampa, Texas; operated only 2 years; now stored at Wink, Texas

EXCELLENT CONDITION

Principal Items

1 No. 25 Southwestern Gasoline Plant-Pumps and Fittings.
1 No. 75 Southwestern Gasoline Plant-Pumps and Fittings.
4 80-H.P. Type X Bessemer Direct Driven Compressors 16 x 20.
2 165-H.P. Type X Bessemer Direct Driven Compressors 16 x 20.
2 Large Steel Buildings for Compressors and both S. W. Units.
6 No. 140 Southwestern Gas Coolers.
3 7' x 35' Horizontal Steel Tanks.
Scrubber Tanks — Storage Tanks — Pumps — Fittings — Valves

Will Sell Complete or in Parts
Inspection Invited—Call or Write

INDUSTRIAL SUPPLY CO., Inc.

500 Eighth Street Wichita Falls, Texas

Nationally known lines of New and Used Oil Well Supplies.

For Sale—Equipment

25 K.W. and 40 K.W. Gas Engines, 220 volts, D.C. Two 100 K.W. Gas Engine-Generator Sets, 220 volts, D.C. 7x6 Ingersoll-Rand ER-1 Air Compressor, Six-inch Oster Pipe Threading Machine. Also large stock of lathes, pipe machines, milling machines, etc. Send for our list.

Terms to suit.

CINCINNATI MACHINERY & SUPPLY CO.
26 West 2nd St. Cincinnati, Ohio

Help Wanted

Engineer Wanted

Engineer experienced in designing oil field drilling equipment. Good opportunity for competent man. Give full particulars of experience and education which will be considered strictly confidential. The men in our Company are acquainted with this advertisement. Address Box H-221, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED: High class salesmen for excellent Texas proposition in heavy lease and drilling campaign along Balcones play. SEC. complied with. Penn Oil Corporation, 706-12 Herskowitz Building, Oklahoma City, Oklahoma.

Financing

JAMES E. MILLER, 604 W. Seventh St., Tulsa, Okla., will aid in financial marketing problems. Fee basis.

PROSPECTUSES prepared and deals shaped up for registration or exemption under Federal Security Act. Fee basis. John Morris, Box 5411, Philadelphia, Pa.

Equipment Wanted

WANT to buy for salvage, abandoned properties in any field or line pipe or casing on top of ground.

E. K. SUPPLY COMPANY
Ketchum Hotel, Tulsa, Oklahoma.

Mailing Lists

OF ROYALTY investors by deed, guaranteed. Oil Industry Mailing List Co., Tulsa Loan Building, Tulsa, Oklahoma.

Patent Attorneys

REGISTERED PATENT ATTORNEYS
United States and Canada
Before disclosing your invention to anyone, send for blank form:
"Evidence of Conception."
Instructions "How to Establish Your Rights" and complete information FREE!
LANCASTER, ALLWINE & ROMMEL
418 Bowen Building,
Washington, D. C.

Petroleum Eng. Laboratories

GEOLOGIC STANDARDS COMPANY
1600 East 5th Place, Tulsa, Oklahoma.
Porosity-Permeability-Saturation Tests.

Mining

FOR SALE
UNEXPLORED GOLD MINES
In the Republic of Panama, Central America

PARIS GROUP—Six kilometers of gold land with numerous rich veins. Abundant in timber. Motive power available at nearby rivers. Crossed by National Highway which reaches the Panama Canal.

YUCO GROUP—90 Hectares. Assay of sample taken at different parts and depths show a mean result of 1.40 oz. of gold per ton.

WRITE—R. F. Morales, Box 326, Panama City, Republic of Panama. Cable Address: MORANOS.

FOUR Lincoln Engine driven arc welders, A-1 condition. Stationary type. Service Co., 3732 Cedar, Cleveland, Ohio.

FOR SALE—Air Compressor Laidlow-Dunn Gordon, 12 x 18—12 x 12 double cylinder steam driven. I. Jaffee & Sons, Dallas, Texas.

NEW BELTING 25 to 40% OFF
All sizes—new first grade stock—specially underpriced to introduce our rubber belting department.
K. C. PIPE & SUPPLY CO.
Boulder at Cameron Tulsa, Okla.

1—122' American Angle Iron all steel derrick. Steel Storage Tanks 10,000 to 80,000-barrel capacity. Steel Sheets 3/16" to ½" included all sizes. Guaranteed like new. Immediate shipment and very low prices on all these items.
PIPE & MINING SUPPLY CO.
Box 1431
3063 Brighton Blvd., Denver, Colo.

FOR SALE—One No. 2 Nat. drilling rig, string cable tools suitable for largest spudder; 50 H.P. gas motor. H. J. Steward, Sisterdale, Texas.

SEVERAL USED ROTARY RIGS
Spudders and Drilling Machines.
Several Steel Derricks & Rotary Equip.
J. S. Daniel, Beacon Bldg., Tulsa.

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Oil Man's Calendar

May

15—Tulsa, Institution of Petroleum Technologists, American Meeting, Mayo Hotel.

16-23—Tulsa, International Petroleum Exposition and Congress.

21—Tulsa, Independent Petroleum Association of America, midyear meeting.

22—Tulsa, National Stripper Well Association.

25-27—New York, A.G.A. Production and Chemical Conference.

25-28—New Orleans, La., National Association of Purchasing Agents Convention.

29-31—Dallas, Tex., National Oil Scouts Association, Baker Hotel.

June

17-20—Dallas, Tex., American Society of Mechanical Engineers.

18-19—State College, Pa., Pennsylvania Grade Crude Oil Association, thirteenth annual meeting.

June-July

29-July 3—Atlantic City, N. J., A.S.T.M., annual meeting.

September

7-12—Pittsburgh, Pa., American Chemical Society, semiannual meeting.

?—Tulsa or Oklahoma City, American Petroleum Institute, Division of Production, Mid-Continent district.

October

?—Cleveland, Ohio, American Institute of Mining and Metallurgical Engineers.

November

9-12—Chicago, American Petroleum Institute seventeenth annual meeting.

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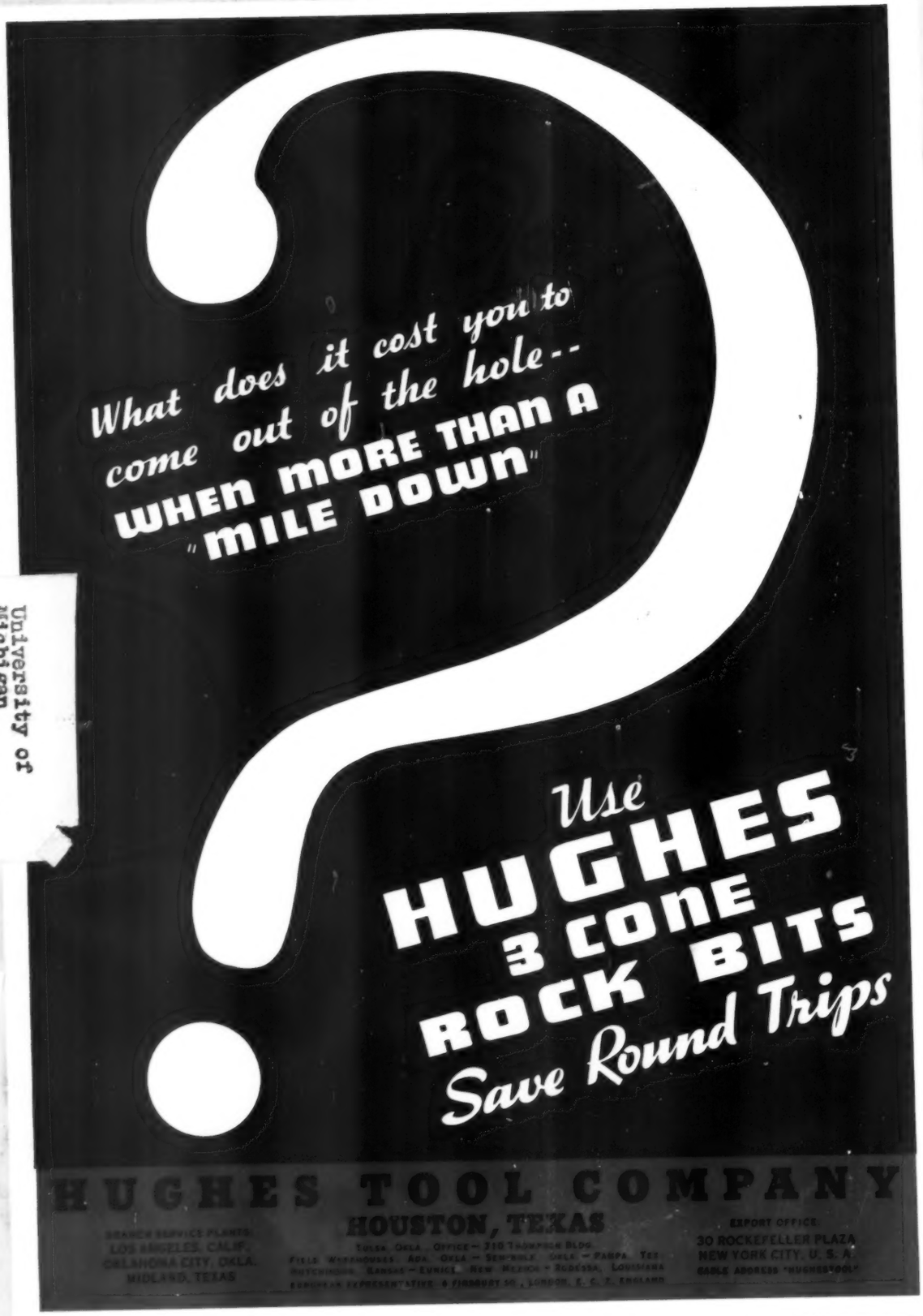

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